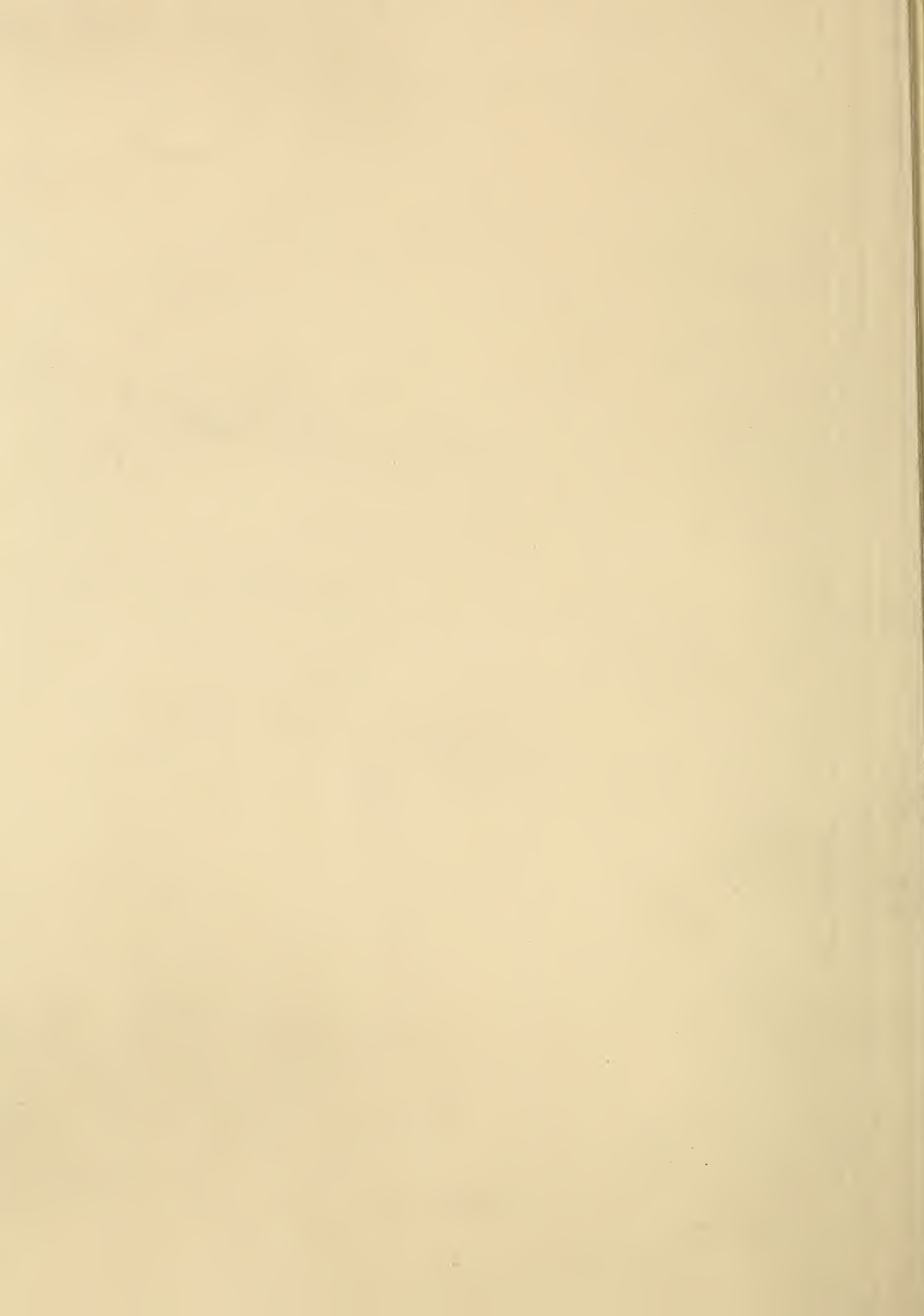


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"No ONE can write for bee-keepers but bee-keepers," says *British Bee Journal*.

DADANT says queens are less likely to go up and lay in shallow frames than in deep ones.—*A. B. J.*

"APICULTURAL literature was never better than it is to-day."—*Review*. Right you are, W. Z.

336 POUNDS of comb honey is what J. D. Endicott reports in *A. B. J.* from a colony hived June 10.

TWO COLONIES whose hives stood 3 inches apart, are reported in *A. B. J.* as working together all summer.

FORMALIN, a near relative of formic acid, is spoken of in the German bee-papers as the coming cure for foul brood.

GRAVENHORST thinks bees contract their entrances toward winter, not to keep out enemies, but to keep out chilly winds and the light.

IT IS AN OLD fable, that, to eat fish, makes brain. U—m! Why is it that fish are so plentiful and brains so scarce?—*Dr. Peiro, in A. B. J.*

PEACH-PITS, one eaten every hour or so, are recommended by Dr. Peiro, in *A. B. J.*, for cough and whooping-cough; and for dyspepsia, baked apples.

GRAVENHORST finds that a swarm furnished with foundation from the start is not a whit ahead of one which is first compelled to build five or six natural combs.

A COMB, no matter how many times it has been filled and emptied, becomes constantly better and stronger for extracting purposes.—*Chas. Dadant, in A. B. J.*

A MUTUAL-INSURANCE company of bee-keepers at Lueneburg is mentioned in *Centralblatt*, having had a successful career of 15 years. It prevents damages to bees through spite work,

as the loss to the individual bee-keeper is slight.

J. A. GREEN says, in *A. B. J.*, that he once had a large lot of queen-cells built in January, and sold the royal jelly at \$25 an ounce, presumably for medicine.

H. W. BRICE says in *B. B. J.*, that, when he has trouble uniting bees, it's always those with old queens, while bees with young prolific queens may be united almost any way.

GREAT WILLOW HERB, *Epilobium angustifolium*, says R. H. Ballinger, in *A. B. J.*, has for years been used by the Indians from Neah Bay to Alaska for making thread and fish-nets.

THE *Nebraska Bee-keeper* gives quite a full list of honey-plants in Nebraska, and says, "It well repays the apiarist for even breaking off small limbs" of box elder so the bees can get the exuding sap.

QUICK CURE for bad cold. Mix a tablespoonful of honey in as much lemon juice in a big pint of water, dusting into this a little cayenne pepper. Drink at once, and keep warm in bed.—*Dr. Peiro, in A. B. J.*

IN BRUSHING bees off combs when it's too cold for them to crawl back into the hive, put two or three bottomless hive-bodies over the hive and brush the bees into this as into a funnel. So says J. A. Green, in *A. B. J.*

MOTHER.—"You are at the foot of the spelling-class again, are you?"

BOY.—"Yes'm."

"How did that happen?"

"I got too many z's in scissors."—*Good News*.

A PARADISE for bees is described in *A. B. J.*; and then the question is asked, "How many bees can be kept there in one apiary?" The answers vary from 75 to 500 colonies, which goes to show that no one knows much about it.

THE *Review* reports a new non-swarmer arrangement of L. A. Aspinwall. Near swarming time, between each two brood-combs is put a half-inch board filled with holes like cells, but running clear through. The bees can't fill

those holes, and they think there are too many empty cells to swarm.

"BEES WILL WINTER better in the cellar, if in chaff hives, than they will in single-walled hives, providing they are fixed as they should be in the cellar." Each hive is raised three or four inches from the bottom-board, and its cap is taken off. The bees eat less, and hence are healthier. So says Doolittle.

NEAR THE CLOSE of the main honey-flow, put ripe queen-cells in supers or extracting-stories, and in four cases out of five your old queen will be superseded.—*E. F. Quigley, in Review.* I tried a lot in that way, and all failed. But I did it at the beginning of the honey-flow.

"DO THE FIVE-BANDED Italians average better than the three-banded or worse?" To this question in *A. B. J.*, Doolittle replies, "Equally good or better during 1894." Dr. Tinker thinks favorably of them, while the rest either think there is no difference, or that they are not so good.

THIS JOKE is on me. T. P. Andrews sends a postal: "Why don't you look in the Standard dictionary when you want to know what a word like *lysol* means?" Looking, I find, "Lysol. A saponified product of coal-tar, containing cresol: used as a disinfectant." So that's the new foul-brood cure. But, say, isn't there a law against writing "sassy" things on a postal?

DADANT, in the *Review*, takes the ground that the greater or less ductility of foundation is not due to the manner in which it is *melted*, but to the *manipulation* that it undergoes when cold; that rolled foundation is like wrought iron, and Given or cast foundation is like cast iron; and, moreover, that, "foundation which has been standing a long time becomes more and more brittle, so that, at the end of a couple of years, a piece of molded foundation is about as brittle as a piece of fresh Given foundation." [We are now working on a set of *rolls* to make Given foundation. In comparing the article from the press, I found that its distinctive feature was thick and heavy side walls, and these can be made on rolls as well as on the press. Our Mr. Washburn, from a sample of Given, made a punch to emboss the rolls that I expect will duplicate the side walls of Given foundation made by Mr. Taylor on his press. We made some experiments in this line last summer, and the results were exceedingly gratifying. This time we propose to go one step further, and make an exact duplicate of Given on *rolls*. Now, then, we confidently expect that this wax will have all the good qualities of both the rolled and the Given foundation. Now, then, do not go and send in orders; because, as soon as the wax is ready, due announcement will be made, so that all can test it who desire.—Ed.]



## LARGE HIVES.

WHY THEY ARE MORE PROFITABLE; EGG-LAYING CAPACITY OF QUEENS, AND ITS RELATION TO THE SIZE OF THE BROOD-NEST.

By C. Dadant & Son.

*Friend Root:*—Your little editorial on large hives, page 101, was duly perused; and the taunt that it contained, viz., "Now that there are more bee-keepers on their side, perhaps they can set forth their views with more assurance," had the desired effect; for we were preparing an article in reply when we received your letter calling our attention to this matter. Indeed, after all we said on the subject, in *Langstroth Revised*, especially pages 150 to 153 (see note at bottom of page 152), and after all the articles we have written from time to time in different bee-journals, what do you expect us to do to get the bee-keepers to try large hives? Must we adopt the plan of the train-robbers, who ask for your money or your life, and demand of you and others "*large hives or your life*"? Would that be setting forth our views with "assurance enough" to suit you?

We have never lost an opportunity of setting forth our preference for the large hive and for the large frame; nor is it a whimsical fancy that led us to this preference, but a protracted experience with three kinds of hives—the ten-frame Langstroth, the eleven-frame Quinby, and the fourteen-frame American. We began with a nine-frame hive here, in 1864 or '65, the frames of which were about like the American frame, and increased these hives to 14 frames in the course of a few years. We have had for 30 years from 10, at the beginning, to 60 hives of this style in use. We still have about 60 of them. We then tried the eight-frame Quinby; and afterward, in 1868-'69, made these hives with from 10 to 14 frames, finally settling on the eleven-frame as the best size for us. Then, as we were selling bees in hives in large numbers, in 1872-'76, we concluded that we had best keep the then most popular hive, the ten-frame Langstroth, and we made 100 of them. These, with a few eight-frame Quinby hives, were kept first in a separate apiary, and later were divided in equal numbers with larger Quinby hives in two different apiaries. In spite of the meager returns of those small ten-frame Langstroth hives, we kept a number of them until three or four years ago, for the reason that, when a colony of bees was purchased of us, it was usually wanted in a Langstroth hive; the bee-keepers who bought such colonies having their apiaries already stocked with this style of frame. But as we found, again

and again, that the smallest crops came from the smallest hives, on the average, and that, whenever the crop was short, twenty-seven out of every thirty small hives had to be fed, while the large colonies had generally enough, we transferred all the bees out of these ten-frame Langstroth hives, and we now have a lot of these old hives piled behind our honey-house, waiting for a buyer. But they will probably soon make kindling-wood.

The same experiments have been made by large producers in this country and in several countries of Europe, with the same results. Some of these are related in Langstroth Revised.

That a large hive gives better results may be easily explained, and without rational contest, since it can not be denied that the amount of honey gathered by a colony is in proportion to the number of bees the hive contains. The writers of old books on bee culture, being unable to reckon correctly the number of eggs that a queen could lay, had guessed it very much too low. Now it is proven that most of the queens, in favorable circumstances, lay 3500 eggs in 24 hours, during spring. We have ascertained that some of our queens laid more than 4000 eggs; and a bee-keeper, Mr. P. Bois, of Jersey, a reliable man, reported in the *Revue Internationale*, that one of his queens laid as many as 5000 eggs in 24 hours. Is there any thing improbable about this? Authorities agree that the queen can lay her weight of eggs in 48 hours, consuming honey in proportion. We have often seen a queen, in an observing-hive, lay six eggs in a minute; this would make 3600 in ten hours, 4320 in 12 hours. Now, as it takes 21 days for an egg to become a bee, if we suppose a possible laying of 3500 eggs the queen needs a number of cells equal to  $3500 \times 21$ , or 73,500 cells, in addition to the cells needed for the indispensable stores of food, honey, and pollen.

The Langstroth frame measures 142 square inches; and as every square inch contains 55 worker-cells, 27 or 28 on each side, one frame contains about 7800 cells: an eight-frame hive, therefore, has but 62,400 cells, and a ten-frame 78,000. Deducting from this number about 20,000 cells for stores and a little space ahead (for the queen surely can not fill every cell as soon as vacated), we have, to receive the daily laying of eggs, 42,400 cells in the eight-frame, and 58,000 in the ten-frame hive; and this, divided by 21 days, gives us a capacity of but 2000 and 2800 eggs per day. In short, an eight-frame hive can accommodate only a rather inferior queen. Will you need authority for this? We can give you some very near home.

We read in the *A B C of Bee Culture* (are you acquainted with the author?) under the heading, "Loss of Queen," "If we assume the number of eggs a queen can lay in a day to be 3000, by taking her away a single day we should, in

the course of events, be just that number of bees short right during a yield of honey." Then the lack of room in a ten-frame hive reduces the laying, according to this author, 200 eggs per day, or 4200 during the 21 days; and the famous eight-frame hive reduces the number of workers, in 21 days, just 21,000. Would not this make a fine little swarm? What qualities do you find in the eight-frame that will make up for this loss? Mind, we take the number of only 3000; but what is the loss if the queen is capable of laying 3500 eggs or more per day? As a matter of course, even with these ten-frame hives you will not know what she is capable of doing, and you will ignore your loss altogether. We acknowledge that the author of the work above cited must not have been very sure that the average queen could lay that many eggs, else why should he ever advise any one to change from a ten-frame to an eight-frame hive? And yet when he states the probability of her being able to lay that number, he places himself with only the most conservative authors—Dzierzon, Thos. W. Cowan, and others.

In 1857, Berlepsch counted the eggs laid by a queen in 24 hours, and this number was 3021. Numbers of writers agree that the minimum laying of a good queen, in the busy season, is 2000 eggs per day. With your eight-frame hive you compel them to the minimum rate.

About three or four years ago a bee-keeper wrote, in the German bee-journals, that queens were unable to lay more than 15 or 16 days in succession, and stopped very often for five or six days at a time. The Swiss bee-keepers, who nearly all use large hives, investigated this matter, and unanimously reported that they had been unable to find a trace of any such intermissions. The explanation was easy: The German hives are all small, and the queens fill them very quickly. Their cessation of laying is caused by their being short of room before the hatching of the first-laid eggs.

In very small hives, not only the queen but the bees are dissatisfied, and swarm frequently. Some bee-keepers, who wish to increase the number of their colonies, may like this; but the men who have enough colonies, and want honey, do not relish the swarming so well, for it compels them to watch their hives, and often to leave their occupation to harvest swarms that are often of little value. The increase by natural swarming is less desirable than that by artificial division: for in the latter case the bee-keeper can select his breeders. Natural swarming is, therefore, objectionable in several ways.

You will object here, that you can give room to your bees by piling two or even three hives on top of one another, thus giving the queen all the space needed, and more. Aye, "and more." In fact, you give them too much space this time, and often too early, when the weather is too cool, or too late, when the crop is very near

at hand. These double hives contain 124,800 cells, while our large hive contains 99,000, or 25,800 less. Many of the cells, unoccupied with brood, will be filled with honey that will have to be extracted from frames containing brood, in many cases. Very often the reduction of such a large hive leaves the colony with too little honey for winter; while with the large brood-chamber we may be sure that we always leave enough, and we dispense with the removal of honey from the brood-combs.

We have ascertained that spring honey makes better winter feed than the darker honey of fall, and we are enabled to leave enough of it in the brood-apartment, without any manipulation, for the winter supply. With shallow supers over a large brood-chamber, we rarely get brood in the upper story, and have no difficulty in removing the bees in using the bee-escape, for the queen is usually where she belongs—in the brood-chamber. The manipulations for extracting are, therefore, much simplified.

The bee-keepers who use small hives have to use the queen-excluder when working for comb honey, because the queen is short of room, and lays wherever she can find space, without regard to the color of the comb, in those beautiful basswood sections which afterward give only a second-grade honey. The queen-excluder increases the expense and the work for the bee-keeper, and the unpleasantness for the bees.

Your double-story eight-frame hive is an unwieldy affair, too large when first doubled, and too small when reduced by half; too high for its width, and with too little room over it for a big crop of honey, unless you tier it up to the skies. With the large brood-chambers, all in one story, our breeding-room is always ready; the amount of honey left over is in proportion to the size of the colony; the breeding is pushed along uninterruptedly during spring, and the surplus capacity is very large, owing to the width of the hive. The most prolific queens are easily ascertained, and may be used as reproducers. As the colonies are all more populous than with small hives, their capacity for storing honey is larger, and their wintering is better insured by their greater strength.

Now, friends, if we have placed the matter before you with too much "assurance," blame but yourselves for it. We did not seek the discussion, but are always ready to take our own part.

Hamilton, Ill.

[I certainly did not intend to throw out a taunt of any kind; but if what may be construed as such has been the means of calling out a valuable article that we otherwise should not have received, I am glad it went in.

Regarding the use of two eight-frames, one on top of the other, versus a ten or twelve frame all in one brood-nest, I must confess I am gradually coming to the opinion, from the testimony so far received, that 16 frames, or the double brood-nest, is too large; that the

twelve-frame\* capacity seems to be a maximum. But I am not prepared yet to accept the statement that this size is the best, all things considered, for all bee-keepers, although I am inclined to think it is about right for the Dadants. If, then, we must have a large hive, the weight of testimony seems to be so far in favor of not more than twelve-frame capacity. Now regarding the egg-laying of queens:

On page 138 of our last issue, Mr. Doolittle seems to have almost anticipated an answer to Mr. Dadant's statements. Among other things he says: "With the large hive the bees are quite likely to get the start of the queen, and commence to store honey in the brood-combs before entering the sections at all, and in such a case the bees seem loth to go into the sections." During the poor years of late it has been hard to get even an eight-frame brood-nest so crowded as to force any surplus above. Again, he says: "It is well to remember that all queens are not equally prolific; and while 20 per cent of our queens would keep the brood-chamber of a ten-frame Langstroth hive properly supplied with brood to give the best results in section honey, the other 80 per cent would not be prolific enough to do so; and that, because a queen may lay 6000 eggs daily by using plenty of comb capacity and coaxing, it does not necessarily follow that it is to the best advantage of the apiarist to accommodate or even coax the queen to bring her fullest laying capacity to the front at any time." Further on, he thinks that the queen should be rather above the capacity of the brood-nest than otherwise. From all his past experience he believes that 2400 eggs would be a good maximum average. In the same number, Mr. Boardman thinks it is not so much the *large hive* as the laying capacity of the *queen* that regulates the size of the colony.

My own views are subject to revision, for I can not, in the beginning of things, strike the golden mean. I do not wish to appear to be fickle, and jumping from one thing to another; nor do I desire to stick to one idea year after year, right or wrong, and try to bolster it up by all sorts of arguments. I do not wish to be construed as being strictly an advocate for an eight-frame hive, nor for a ten-frame or twelve-frame. In our catalog for this year we have given our customers the option of any one of the three sizes. We give them, as fairly as possible, the advantages of each size, considering the matter of locality, so that each one may decide for himself. If one is a beginner, and does not know what he wants, we recommend the eight-frame size, because the majority of our customers have elected it in the past; and because, too, when we were making the ten-frame size only, the pressure got to be so great that we not only admitted the eight-frame size on an equal footing, but later on gave it the foremost position.—ED.]

## EXPLANATIONS AND ANSWERS.

### MISCONCEPTIONS CORRECTED.

By C. A. Hatch.

One of the perils and disadvantages of writing for the press is in being misunderstood and misrepresented by those who hold opposite opinions. I suppose one of the chief reasons for this is the poverty of written language as compared with spoken. In the written, all the

\* A twelve-frame Langstroth has about the same capacity as the Dadant hive.—ED.]

expression of features, inflection, and gesture are all lost; and what would be very easily understood in the way the speaker intended when standing face to face, becomes a mystery when reduced to the dead level of cold type. He must be a master indeed who can express his opinions and ideas as well with the pen as with the voice.

While I think none have willfully misinterpreted my articles on the eight and ten frame question, many have ascribed ideas and opinions to me that I never held, and that have been furthest from my thoughts while penning the articles; so I shall have to lay the cause to one of two reasons—either my poverty of expression is so great that I have failed to say what I wanted to, or their discernment has been so keen that they have read between the lines things that were never there.

My time is so taken up at present that I can not hunt up each specific case, but must generalize somewhat.

#### DO I BELIEVE IN AND PRACTICE TIERING UP?

Most assuredly, I do; and yet some seem to think that I advocate only side storage and the "Long-Idea" hive, simply because I think bees will increase faster, and get stronger by the beginning of the honey harvest, if a hive is used large enough to keep the queen laying up to her capacity, without putting another hive over it. After the harvest commences, tier up as high as you like—one, two, or three supers, as the strength of the colony will require. I do not remember of ever having a colony require more than three full-sized hives on top, to give all the room needed, but have had any amount of them that require four hives, in all 34 frames, to accommodate them.

#### QUEEN GOING DOWN OR UP.

I have never had any trouble from the queen going down after putting another story on, if the top hive is allowed to get full; but this filling of the top hive with brood is *always* at the expense of emptying frames in the lower hive, for I never had a queen that would keep both hives full of eggs; and if she is crowded down for lack of room above, it is two or three days before she will go, and hence so much lost time at the most critical time, just before the harvest begins. Therefore I'd rather have a hive up to her fullest capacity, and have her doing her best at all times.

E. France asks if I would call a queen that could keep only eight frames full a "boomer." Yes, indeed, I would; but when I say "full," I mean full and kept so.

#### WHERE THE QUEEN SHOULD BE KEPT.

After the honey harvest has commenced, and all has been done to get your force ready for onslaught of field and forest, it is of but small concern of mine where the queen is, or that they have a queen at all. In practice, no attention is paid to that part of the hive—i. e.,

the lower story; the main thing is to keep plenty of empty combs *over* the brood-nest.

#### THAT BEE-TREE PROBLEM.

The facts as to the condition of the combs and colony living in the tree, as described by Mr. France, are, first, the cavity occupied by them was largest in the middle, and tapered toward each end, being six feet long by  $2\frac{1}{2}$  feet in the middle, and all the brood at the lower part, and two feet or more below the entrance. I infer that all the top part of the hollow was filled with honey, although Mr. F. does not say so; but as he says a tubful was taken from the two trees, and only two dishpanfuls from the other, the last must have had a washtubful, less the aforesaid two panfuls; as, of course, there was not much room, if any, for brood except at the lower end of the hive, or just *below* the honey, where I should expect to find it. Now let me answer Mr. F. by asking him a few questions, like any other Yankee. 1. Was not this at the close of or after the honey harvest? and was not the queen crowded down by the honey stored in the combs above? or had not she arranged things for consumption rather than for production? Remember, it is *before* the harvest I have been talking about, not *after*, when instinct teaches the bees to arrange their brood-nest for winter convenience and accessibility of stores. 2. Were the conditions, aside from time of year, the same where there was a continuous comb from top to bottom, and two hives, one over the other, with two strips of wood, and a bee-space varying all the way from  $\frac{3}{4}$  down to  $\frac{1}{4}$  inch? I do not presume there is one really essential thing that my good friend France would disagree about under like conditions. Our fields vary somewhat, and so require different management to meet those conditions; and this question of management answers many seeming differences of opinions. But this is leading into another field, and I shall have to leave this question for some other, so I can tell how I get along without the disadvantage of lifting my ten-frame hives much, and yet get all their advantages.

Ithaca, Wis., Feb. 11.

[I suppose, friend Hatch, you have myself in mind, as well as Dr. Miller and others who have been on the other side of the fence. I for one had not intended to misconstrue you, but perhaps I did so. In any event, I do not think your position can be misunderstood as above given. In the second place, you have the satisfaction of knowing that you started this discussion, and have brought to your assistance more bee-keepers who are ready to support your views, wholly or in part, than you or any of us were aware of.

I am afraid that some of our readers will not be able to decide this question for themselves. For instance, they will read Mr. Boardman's and Mr. Doolittle's articles in the last issue, and then read your own and Mr. Dadant's article above. All four are men of sterling integrity, and bee-keepers of large experience and ability. Then how shall we get at the truth? Locality seems to me to offer the only

solution; and if we are to follow the advocates of one or the other, we must consider our own locality compared with theirs. Perhaps I ought to say that the Dadants have a much better and more prolonged fall flow of honey than those who advocate a smaller size of hives. With the latter it is not desirable to have a large force of bees after the honey-flow, to be consumers and practically nothing else.—Ed.]

**TEN-FRAME HIVES, MORE HONEY AND FEWER SWARMS; EIGHT FRAMES, LESS HONEY AND MORE SWARMS.**

My hives are all eight frames but one. I have endeavored to follow carefully in the footsteps of the majority, notwithstanding the fact that my one ten-frame hive did just as well as the eight, and never swarmed, and the fact that my neighbors with ten frames get more honey than I. In fact, for three or four years I have been looking for some big report from eight-frame in *GLEANINGS* and *Review*; but the big reports for some reason all seem to come from the ten-frame hive. I am sure that I have lost money and honey in runaway swarms from my small hives. I am confident that, with ten-frame hives and high shade, I shall have non-swarmed bees, and shall not have to be always anxious about a shortage of honey in the hives. No more small hives for me at present.

NEWTON AMERMAN.

Rice Lake, Wis., Feb. 4.

[I thought this would be a good item to put right after the article above; for, indeed, it confirms the position of Mr. Hatch when he had to fight single-handed.—Ed.]

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**CHAFF VS. DEAD-AIR SPACE.**

NOT AN EIGHT OR TEN FRAME HIVE, BUT A COMBINATION OF BOTH.

By C. W. Dayton.

In a back number of *GLEANINGS* I find the assertion that there will be more bees reared in an eight-frame hive because it is warmer. I believe the bees form what is known as an "inside hive." By this is meant that, around the margins of brood, the bees arrange themselves in such solid lines between the combs as to prevent a circulation of air from within or without the cluster, for the purpose of keeping a high temperature there while they allow the rest of the hive to arrange its own temperature; consequently, in cold weather the walls are often coated with frost; and in Southern California, where frosts seldom come, we find the walls and unoccupied combs dripping with moisture. From this it would seem that the ten-frame hive is actually warmer than the eight, as the cluster of bees and brood would be able to locate farther from the outside walls. Even if the cluster was warm enough and near enough to the walls to dispel the moisture or frost it would require warmth to do it, and such warmth would disappear in the operation, and

could not aid in brood-rearing, as where there is no frost to be dispelled.

In Iowa I wintered bees in a room which was constructed entirely within a cellar. There was a beam extending from the outdoor air to the inside room. As the cold increased, the frost began to creep down that beam, inch by inch, until it finally reached the inside room. Then when the weather became warmer the frost retreated up the beam. The farther the inside room was from the outside wall, the more secure from frost. The thermometer said so. Would not this inside room correspond to the inside hive of a colony of bees, and the outer wall represent the outside hive? But the inside hive, of which we speak, is of the same size, whether the outside hive be adapted to eight, ten, or twelve frames. The more frames in the outside hive, the longer beam would there be required between the outside and inside cellar walls. In the large hive there is a wall of wood and a wall of dead air. Will any contend that six inches of chaff packing is no better than two inches of the same material? But it is a mooted question which is warmer—chaff or the space filled with dead air. Where a colony fills the hive, as is likely to be the condition in the eight-frame size, there is the protection of the outer wall only, when, with a hive of greater width, a dead-air space occurs. The more dead air, the more protection. If the whole interior of the brood-chamber were to be kept warm, then the less dead-air space the better. Mr. Langstroth designed to have the winter stores deposited in the rear end of the brood-frames. At that early date it seems to have been known that the long frame was longer than necessary for the accommodation of the brood. It might not be so very bad to have the winter stores in one end of the frames were it not that, a little later on, we *must* have a share of the working force of bees lodged there instead of above in the supers of sections, where they should be. Eight long Langstroth frames have the capacity of sixty-four  $4\frac{1}{4} \times 4\frac{1}{4}$  sections. Eight crosswise frames contain 48 sections—a difference of sixteen. These sixteen sections would fill  $2\frac{3}{4}$  of the crosswise frames. Let the two-thirds of a frame go while we set one of the whole frames on each side of the original eight, and it results in a ten-frame hive with brood in eight combs instead of the old eight-frame hive with brood in only six, and that much exposed at the remote points of the brood-sphere. There might be a comb of pollen also. Since it is admitted that the two outside combs in any hive are not occupied with brood, there would be only four or five brood-combs in the eight-frame hive, while there were six or seven in the ten-frame hive, resulting in more early bees and a more populous hive later on, to send bees into the supers. It would be like a light-weight and a heavy-weight pugilist, both in the same ring; that is, the ten-frame colony

would be the largest—more bees in a larger hive, and a larger super; it would hit just as often, and measurably harder. The eight-frame hive, on account of its hindrance of brood-rearing, defeats its own object—contraction—to get a large force of bees early into the super.

If we admit that ten-frame hives give more honey, then more brood must be produced. I do not believe that more honey will be stored, or more combs be built, simply because there is vacant space; nor will the queen lay more eggs simply because there is a large area of comb; but the work done in the ten-frame hive may exceed that done in eight frames because of inadequacy of the eight; and because eight combs of brood is enough for a colony it does not follow that that number of combs in a hive is sufficient for *all* demands of that colony.

It has been said, that one fact is worth a bushel of theories. Theory tends to improvement; facts stand still. Facts may lead us to settle down upon a ten-frame hive as if it were perfection itself; but theory may devise a hive combining the best features of both the eight and ten frame hives.

If it is proposed to discuss the merits of hives without alteration, then I say that the ten-frame is best to breed up and retain winter stores; but the eight-frame is cheaper, handier, and will send a *given number* of bees into the sections sooner. The retention of winter stores may be preferable to farmers and others who have several irons in the fire, and who would starve the bees were it not left in the hives; but the specialist is expected to look after such things in order to enable him to perform other advantageous manipulations. The eight-frame hive is the farmer's substitute for contraction while he attends to a dairy or fruit-ranch. Said bee-keeper wishes to apply contraction during the honey-flow, but does not want to watch his bees closely during the rest of the year. By his plans he may secure the most profit from a certain amount of labor; but more labor and more profit is what bee-keepers are most in need of. When bee-keepers discuss and adopt hives best suited for farmers they had best consider the advisability of becoming farmers, for they must have missed their calling.

A large amount of honey in a hive causes the colony to build up faster, and become stronger thereby, because there are more combs of honey to be mutilated by frost, moisture, or other consequence, causing honey to be removed and carried to the brood-nest. Again, where there is much honey in the hive, that needed for brood-rearing is brought from the most distant points, and especially where it is liable to be pilfered by robbers. Such manipulation of honey is a constant stimulation. It is not possible for a colony to consume 30 or 40 lbs. of stores in two months' time without being stim-

ulated. Last spring I had colonies which consumed 60 pounds of honey while others survived on 10. In the small hives, where there is only a small quantity of honey, and a comb or two more are put in when the first is all used up, the honey remains entirely within the guard-lines, and there is very little manipulation of honey, and, consequently, no stimulation. Last year the lower hives in my apiary were about half filled with winter stores (I use the crosswise L., ten frames in a hive). Then a super of half-depth frames was put on, which were filled up and capped nicely. For brood-rearing the month of January in my location corresponds to the month of May in Iowa or Illinois. They began to rear brood the fore part of the month, and have taken honey from the ends and corners of those super combs, so that they are not more than half full. Some hives have six combs of brood, flying drones, and young bees by the peck. The larger the size of the frames adopted, and the more in number, the more of this stimulation; especially when the colonies are weak or starting to breed. It is my belief that a brood-nest can not be honey-bound in the spring—only in the fall, when there should be bees reared for wintering. These super combs are the same size as single-tier wide frames; and when it is surplus time I will take out the super combs and put in the wide frames of sections in their stead, so quietly that the bees will hardly dream of what has happened. The combs taken out will be tiered up on colonies which will be run for extracted honey. Habit of clustering in the super is expected to make the bees remain there after the sections are put in. Then I will shut down on the storage of honey in sections soon enough to return the combs to be filled with winter stores. Thus the sections will be all completed. It is my opinion that a better hive might be devised by combining certain principles present in both the ten and eight frame hives. How and what to combine is the question.

Florence, Cal., Feb. 5.

[You say it is a mooted question which is foremost—chaff or the space filled with dead air. Perhaps you do not remember the time when I tried to believe that dead air was just as good, and called for testimony to get at the truth. It came in so thick and fast in favor of chaff, or, rather, filling of some sort, that I think all of us were satisfied that dead air was not nearly as good. Dead air is all right providing you can get it in a space or compartment that is air-tight. But this is impracticable; therefore, to prevent the rapid circulation, and the air escaping, it seems necessary to have obstructions in the way of filling, and thus prevent the too rapid escape of the warm air next to the bees.]

You say the eight-frame will send a given number of bees into the sections sooner. You are probably right; but would not six frames send them there sooner yet? By the way, what has become of the idea of contraction, that we do not hear of it nowadays? There was a time when it was all the rage.—ED.]

## RAMBLE 127.

GAS FOR THE BEE-PAPERS.

*By Rambler.*

Mr. Pryal, having the Rambler upon his hands, felt it his duty to ramble me in various directions around the cities. Near Mr. Pryal's were many beautiful residences, and ample grounds laid out in a paradisaical sort of way. The owners were men of wealth, millionaires; here a grotto of rockwork covered with ferns and flowers, and running water, a beautiful plaything costing only \$3000; there a copper affair made in imitation of half of an immense

time ago; and though he is now out of the business, residing with a daughter here in Oakland, he still retains so much interest as to be a subscriber to GLEANINGS.

Our call was of such a pleasant nature that Mr. N. returned it the next day, and sojourned in our camp for awhile. Mr. Pryal, with camera in hand, gave us a shot while Mr. Wilder and I were enjoying our noonday meal, and a very good photograph of Mr. Norton, leaning against our wagon, is shown.

Immediately after dinner we all started for San Francisco, to make a call upon Mr. Harry L. Jones, a brother bee-keeper. On the way



CAMP ON TEMESCAL CREEK, NEAR PRYAL'S.

sea-shell; the cost of this plaything was \$2000. Across the way is an estate formerly owned by J. Ross Browne, who, when in this life, was a genial writer and traveler. The residence and grounds are fitted up in oriental style, or like a Chinese pagoda. There are quite a number of bee-keepers in a small way around the cities of Oakland and San Francisco, but not much attention is given to the industry as a business.

Our first call was upon Major P. L. Norton, not only a veteran bee-keeper, but a veteran of the war, as will be seen by the handle to his name. Mr. N. is from Lanesboro, Pa., where himself and son were successful apiarists. Mr. N. imbibed the love of the bee in boyhood, and has never lost it. He invented a self-spacing frame that was illustrated in GLEANINGS some

across the bay Mr. P. informed me that Mr. Jones, besides being interested in bees, was a gas collector. Now, imponderable substances, such as electricity, etc., were always a mystery to me, and I said to Bro. Pryal, "What on earth does he do with the gas when he collects it?" "Well," says Mr. P., "this gas business is a very deep question. Ask Mr. Jones about it; he will give you full information."

Mr. Jones lived then away out near the Golden Gate Park; and after we left the cable car we had quite a climb up one of those steep streets for which the city is noted. The ocean breeze comes up here howling from the Golden Gate, and loose things go flying through the air; so the San Franciscans, when they speak of their bracing climate, mean much—its brace

against the wind; and that is not all of it: the evenings are so cool, even in August, that when we were pressing the streets with our feet an overcoat was not an uncomfortable piece of clothing to wear.

We found the Jones residence, and I could not make much of a demonstration over his condition. I had to be decorous, you know. Mr. Jones is a benedict. The chains, however, seem to be worn lightly upon his genial nature. The chief attraction in the neatly furnished room was two bright children—a pretty little girl and a bright-eyed curly-headed boy. The latter lay upon a rug, kicking up his heels in childish glee, and showing to good advantage his first pair of trousers. I could well see that Mr. Jones was proud of his benedict condition, and, of course, I would say nothing to mar his pleasures of married life, and to make him wish himself a roving bachelor.

Mr. Jones has 22 colonies located within a little grove of gum-trees. Every bee-keeper knows that a high bracing wind has a very bracing effect upon his bees; it puts them in a valorous mood. Owing to the amount of bracing climate that the Jones bees were subject to, they were sort o' educated up to a high pitch of aggressiveness. Upon our arrival upon the borders of the apiary the picket-line of cross bees commenced operations; and upon a closer approach, if we passed the entrance of a hive, hordes of bees would tumble over each other to get at us. Mr. Jones's smoker did not send out a sufficient volume of smoke, and we all made for the brush with alacrity; and, after peering through the leafy cover of a gum-tree at Mr. Jones over his pet colony, we all decamped. The place was too hot for us. The stings we had received were longer than usual. (Note the fact in favor of a bracing climate.) If I remember right, Mr. J.'s bees were in the Dovetailed hive and Hoffman frames. That sting back of my ear made me "disremember." We found it more pleasant to talk bees with Mr. Jones in his house. Mr. J. said, with a smile, that, when the bee-fever struck him, he posted right off and bought a foundation-mill. Of course, that would appeal to almost any sensible man. You can not build properly until you lay the foundation; hence the mill before you own a colony of bees. So Mr. Jones was a happy man as he lugged his foundation-mill home under his arm, and dreamed of grinding out tons of honey for the San Franciscans. Mr. Jones is something of a hobbyist, and has run the camera hobby from A to Z. Several other hobbies have had their turn, but the bee-hobby seems to have come to stay, as it always does when it gets possession of a man.

Mr. Jones has always lived in the city, and expressed himself as heartily sick of sidewalks and rows of brick and mortar, and gas. He longed for the free and open country, and a

bee-ranch, and is taking such active steps in that direction that, ere many weeks, we may expect to hear of him as a full-fledged bee-master.

"Oh!" said I; "Mr. Jones, I understand you are a gas collector. What do you do with that sly imponderable substance?"

"Why, Mr. Rambler, I send it back east. You see, California gas is the best in the world. Just see how our towns have grown under a liberal supply of gas. Ours is the genuine boom gas. Why! there are hundreds of towns in this State that are all gas. You go out on the desert and see little white stakes marking out lots, streets, and avenues. Still, that appears on paper as the beautiful town of Vistablend—all gas, and too much gas in those cases."

"Well, Mr. Jones, I should like to know who wishes California gas, back east."



"That's a leading question, Rambler; but seeing it's you I will tell you. I send gas to merchants—notably, ready-made clothing, dry-goods, horse-trainers, and a large amount to patent-medicine dealers."

"Well, now, Mr. Jones, do you send any to our friends the bee-keepers back east?"

"Ha! ha! Yes, all of the bee-journals order more or less. There's the Roots and Hutchinson, who order temperately. York's orders are increasing; Alley orders largely, and I have strong hopes in that line for Heddon; he is doing remarkably well for a beginner. Canada bee-keepers would like our gas, but old Hingland has such a grip there that it's hard to let go of the inferior quality. W. F. Clarke gets

a little of our gas occasionally, and improvement in his writings is noticeable. Somnambulist, of the *Progressive*, orders largely; and Hasty, of the *Review*, has a regular monthly bag. But there's Jake Smith. He gives me big orders right along. Why, I believe that fellow is like some of the above towns spoken of—all gas."

"Why," said I, "Mr. Jones, Jake has skipped the country. He does not write for the papers any more."

"Yes, he does; but it's under another name. Let me whisper in your ear" (and we hitched our chairs together in the corner of the room).

"Ha! ha! Is that so? Then Jake Smith is—"

"Sh—! don't mention it; but he is the best customer for gas all the same. Now, Mr. Rambler, while we're on the subject, don't you wish to buy some for your Rambles—tone 'em up a little, you know?"

"No, thank you, Mr. Jones. I never used the imponderable substance, and don't believe I shall use it now. No, sir; no gas in Rambles."

It was quite late when we returned to the Oakland side of the bay; and as we rested in our camp it was sweet dreams of fair women and laughing-eyed children that floated through the dreams of the Rambler.

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### QUEENS TO FOREIGN COUNTRIES.

SOME OF THE DIFFICULTIES, AND HOW THEY HAVE BEEN OVERCOME.

*By G. M. Doolittle.*

As will be found in back volumes of GLEANINGS, I sent the first queen that ever started in the mails, from this country for Australia or New Zealand, in August, 1884, the same arriving in New Zealand alive, although she died soon after landing, before she could be introduced. My next trial proved a failure, as, at that time, I did not know the running time of the steamers plying between here and that country. The partial success of this first venture, if it might be called a success at all, stimulated me to experiment further along the line of shipping queens to foreign countries, and the next tried was to Scotland, Ireland, and Jamaica, West Indies. About fifty per cent of these went alive, which gave me still more faith in the project of mailing queens long distances. That my faith might be strengthened, and that I might establish something definite in regard to the matter, I began experimenting here at home. I went to work and made cages of different patterns, provisioned them to the best of my knowledge, placed in them bees of all ages, together with a young vigorous queen, and then placed these cages in my shop and elsewhere, coming as near the conditions which they must meet in going long distances as was possible, hoping to prove something definite in the matter. Some were

placed in the loft to the shop, where they would be in a sweltering heat a part of the time—this to represent what they must endure in passing through the torrid zone, while others were left out in the sun, and still others in a fairly comfortable place in the shop. Some of the cages were provisioned with honey, but the most of them with the Good candy. Some were wrapped up closely in a leather bag, to represent what the mail-bag would be to them, while others were not wrapped up at all. Some were tossed about nearly every day, and even thrown across the shop, to represent the throwing of mail-bags off a train while in full motion, while others were handled only once a week. Some cages were thoroughly ventilated, and others allowed very little ventilation. In this way I sacrificed some 15 or 20 queens, and conducted these experiments through several months. The result was, that the average living time of the bees and queens was about 18 days, while no queen in those tried lived over 26 days. The workers would usually begin to die in from 12 to 20 days; and after they commenced to die they went rapidly. After all the workers were dead the queen would soon die; and in no case, during these experiments, did I have a queen live over three days after all of the workers were dead. From these experiments I settled down to the conclusion that it was useless to try to send queens by mail where the trip would take more than 26 days, so did not try to send them a greater distance than 3000 or 4000 miles.

In 1891 I received several orders for queens from Australia, the parties saying, "Try the thing and see how it will turn out." I did so, and the result proved far better than any of my experiments here at home, for I succeeded in getting over there alive about 65 per cent of those sent, none of which were less than 36 days *en route*, this being ten days longer than the best one in the experiment lived. Here is something I can not understand—why bees and queens will live longer while in transit than they will when being experimented upon, and not traveling half a mile, all told.

In one of the cages sent in 1891 I put 35 bees, and every bee in this cage, excepting two, arrived at its destination alive, being 38 days in the cage. This success of 1891 gave me new courage; so when the time came to send queens to Australia in 1892 I started them with quite an assurance of success; but, lo! when the reports were all in I found, instead of 65 per cent alive, or better, as I had hoped, that 35 per cent was the best I could bring the figures to, while the results of 1893 came near discouraging me entirely, as that year 8 per cent was all that reached their destination alive, in spite of all the pains and precaution I took in putting them up. During the spring of 1894 I put considerable thought into the matter, as I had quite a good many orders for queens from New

Zealand, New South Wales, Queensland, Victoria, Tasmania, and Western Australia to fill. One day it came to me in this way:

You know, Doolittle, when you used to give bees candy for winter stores, they would do well on it as long as there was honey in the hive to help them a little; but when the honey was all gone they would often die with plenty of the candy left. Then, again, it has been reported to you that, where the bees had arrived dead, they were almost always daubed with soft and sticky candy, the same becoming too soft to stay in the candy-apartments for some reason or other; and upon thinking these matters over it came to me that I should put into the cage a small piece of comb, the same having a few cells of unsealed honey, and the rest empty cells. The cells of honey would help the bees liquefy the candy were it too hard; and should the candy become too soft, then the bees could lick it up and store it away in the cells instead of their becoming all daubed over with stickiness, which is always sure death to bees; besides, it would make the cage more homelike.

From the above I concluded to put such a piece of comb in every cage, and did so, after first allowing the bees of some hive to lick and clean up all honey set to running in cutting the comb to the desired shape. As the last steamer brought in the last of the reports, I have been looking over the matter to-day and find that the results of the shipments for 1894 prove that I succeeded in landing 70 per cent of the whole sent to foreign countries alive. As this is 5 per cent better than the best ever before recorded, of course I am pleased, and fully believe that the little piece of comb put in had much to do with the success. Those sent to western Australia gave 33 per cent alive, after a journey of 14,000 miles and a confinement of 46 days *en route*. Here it will be noted that a queen—yes, and several worker-bees also—lived 20 days longer than the very longest to live in any of my experiments; and the report says that the cage and bees were clean and nice, with stores for 15 to 20 days longer.

But there is another item which I wish to speak about before I close this already too long article. It is this: None of the parties shipped to knew that I was going to put the piece of comb in the cages, so the thing drew out many remarks and comments in the reports. Among others, two asked why that piece of comb, and whether there was any brood in it when I started it. Others said I put in too many bees (I generally put in from 25 to 30), and advised putting in not over 12 to 15. Putting these two items together, I think I see something else to our benefit in shipping queens to foreign countries in the future: and next season I shall try not only putting in the comb with a little unsealed honey, but make a cage so that I can put in a bit of comb containing from ten to fifteen unhatched bees in it, they being at a stage

of advancement sufficient to show color in their eyes, so they will hatch in two or three days after starting. Something pointing toward the success of this lies in the fact that I sent one queen by express to Australia, putting in about 70 bees, and brood nearly ready to hatch, to the amount of about as many more bees, after hatching. Through some fault of the express company this cage did not catch the outgoing steamer, although started in good time, so it lay over in San Francisco, Cal., till the next steamer, thus making the time 64 days from the time the bees and brood were put in the cage till the queen was taken out at her destination, and, much to the surprise of both myself and the one who ordered them, the queen and about a dozen bees were as lively as crickets when they arrived, with all brood hatched out of the comb.

As many are interested in the shipping of queens to foreign countries, besides myself, I have given in time these things looking toward greater success, so that any who wish can take advantage of them during the coming season.

Borodino, N. Y.

[During the years 1891 and '92 we, like yourself, were much more successful in sending queens to Australia, and we were almost on the point of guaranteeing safe arrival, but we thought we would wait another year. That year, 1893, a very much smaller per cent went through alive, and the next year was but little if any better, if we except the latter part of it. But since using Good candy, made of honey and coarse granulated sugar, we have had much better success. How we succeeded is shown in the Kind Words department in this and the previous issue. We shall try, this spring, a little sealed honey with the Good candy, and shall await the outcome with much expectation. When you make the cages large enough to take in candy, sealed honey, and a little brood and 70 bees, are you not in danger of exceeding the limit prescribed by the postal regulations as to size and weight of cages?—Ed.]

## ALFALFA AND SWEET CLOVER.

PAYING CROP IN TEXAS, WITHOUT IRRIGATION.

J. D. Givens.

Five years last October I sowed five acres in alfalfa. I broke the ground in September, with four mules hitched to a sulky-plow; then I harrowed it till the ground was in as fine condition as I could make it. I sowed 30 lbs. of seed to the acre, then harrowed it over once, and got a good stand. I cut three crops of hay the first season, and four every season since, yielding from one to two tons per acre, each cutting, and this without irrigation. As a grazing plant it has no superior. I pasture it from September to March, and it is, without question, the finest hog-pasture in existence.

Cows prefer sweet clover. I have two acres of this adjoining the alfalfa. The gate opens just on the line between the two. I soon noticed the cows turning to the sweet clover. I then noticed very closely; and since that time,

without a single exception, the cows would first turn to the sweet clover. This satisfies me that cows prefer it; but, like alfalfa, it produces the very best of milk and butter. I have tried all the different varieties of clover here. Alfalfa and sweet clover are the only two that will make a success in this part of the country. Alsike, white, and red clover will do well here a seasonable year; but these long dry summers do them up, although I have a little of each left from sowing three years ago; but they will not grow here as well as alfalfa and sweet clover. In 1893, I think half of my honey was from sweet clover. It was of a fine flavor, light in color, and of a very heavy body; this season it did not bloom.

#### A DEER RECORD FOR RAMBLER AND WILDER TO MATCH.

Say, Rambler, that picture of that doe on page 868, Nov. 15, looks very natural. But here in Texas we carry them on horseback, when the horse does not buck them off. We returned from a deer-hunt a few days since. Our party consisted of six hunters, a negro cook, seven horses, two wagons, and six deer-hounds; we killed eleven deer. I killed four—two as fine bucks as I ever saw—a fine doe, and a fawn; brother Billie killed four—one buck that had 18 points on his horns, but rather small and crumpled. Mr. Smith killed two, and Mr. Whittaker one. We had a grand good time. On our hunt in 1893 I did the best shooting I ever knew of personally. A large doe and two yearlings ran by me together. I fired four shots and killed all three. I use a double-barreled shot-gun, so I had to reload and shoot the third one before it got out of range. On a hunt six years ago our party killed 15 deer. I killed seven out of that number. Who of our bee-keeping friends has a better record?

Lisbon, Texas, Dec. 26.

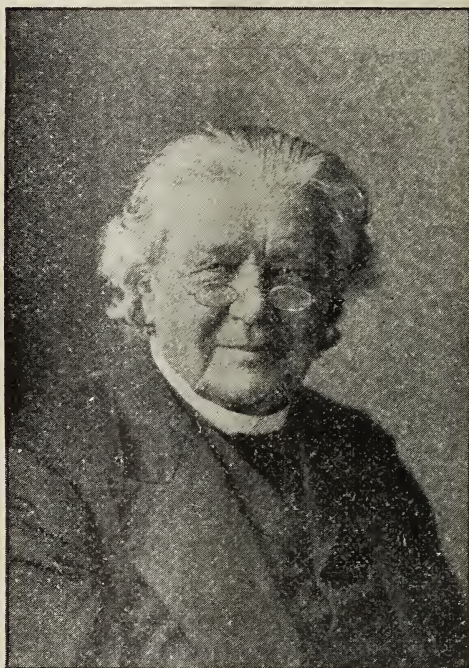
#### A PLEA FOR FATHER LANGSTROTH.

By Wm. Muth-Rasmussen.

I learn on good authority, that many who have been in the habit of contributing to the Langstroth fund at the beginning of each year have not done so yet; and I have reason for thinking that father Langstroth feels the omission. What is the matter, friends? Are times so hard that you can not keep your pledges? or have you forgotten that father Langstroth is still with us—old, poor, feeble, and in need of friendly aid? I know that the past season has been hard on many; but can we not lop off a little expense here or there, to spare a few dollars? Get out your A B C of Bee Culture; look upon the kind, venerable face of your benefactor, and then think whether you have the heart to omit giving your usual contribution, on which he no doubt depends for part of the necessities and comforts in his old age.

Father Langstroth is now eighty-four years

old. It is not likely that he can remain with us a great while longer. When he is dead and gone, the bee-keepers will perhaps rouse up and put a fine monument on his grave. But what good will that do him? Now is the time when he needs our help. When he is gone, his memory will live in the heart of every true American bee-keeper, with or without any monument to remind us of what he has been to us and what he has done for us. I am sure that the satisfaction of having done a kind act, where it is so fully deserved, will amply repay any one for what he may give.



L. L. LANGSTROTH IN HIS 80TH YEAR.

Send your contributions direct to L. L. Langstroth, Dayton, Ohio, or to the editor of the *American Bee Journal*, George W. York, 56 Fifth Avenue, Chicago, Ill., who will forward the money to him.

Independence, Cal., Feb. 11.

[To save the trouble of hunting up the picture in the A B C we reproduce the cut above from the last photo taken of Langstroth, and in his 80th year. Yes, indeed, I know of quite a number who have forgotten their pledges. We have kept up ours of \$50.00 regularly for 10 years, as I see by our books, and smaller pledges before that. It seems to me that all the back pledges should be made up *now*; and I know that there are some at least who are well able to do it. If Langstroth was robbed of his rights as an inventor in his prime, shall he now be robbed of his just dues in his old age, sick and infirm? I make this appeal without the knowledge, advice, or consent of Mr. Langstroth or his daughter; but I happen to know that the money would not come amiss.—Ed.]

## GOING OUT OF THE BEE-BUSINESS.

A VETERAN WHO IS BRIMSTONING HIS BEES.

By T. P. Andrews.

Having been a bee-keeper for the past 25 years, and a reader of GLEANINGS from the first number down to the present time, it occurs to me that possibly some of my experiences and conclusions might interest a few of your readers.

For several years I kept about 300 colonies; and while my locality has not been particularly good I have had some fair crops of honey. My heaviest yield occurred in 1889, when I extracted 7½ tons. I have occasionally had a more valuable crop than that, of comb honey, although of less weight. And now in view of the changed conditions in this locality I have come to the conclusion that the chance for profitable honey-producing is about past, and that I shall have to retire from the business.

To particularize a little in regard to changed conditions, I will state that, so far as I know, I have never had a pound of surplus honey from clover or basswood gathered here, and about the same might be said of buckwheat. Our honey comes mainly from Spanish needle, after Aug. 25, with an occasional light yield from heartsease during the two weeks preceding that date. Honey-dew comes along about once in three years, and saves some of the expense of summer feeding.

When I began bee-keeping much of the land was raw prairie, producing a good deal of button-bush which afforded considerable honey in July, though rarely any surplus. Now the prairie sod and the button-bush are little more than a reminiscence, and, of course, are not, in that condition, of much value to the honey-producer. The more thorough cultivation of the lands, and the growing of a large acreage of timothy meadows, have about cleaned out the wild plants that used to keep our bees through the summer, and have made great inroads upon the heartsease and Spanish needle.

Twenty years ago many farmers kept bees, and there was quite a sale for hives. Now the bees have about all disappeared, and hives are not wanted; neither is there any demand for bees. This state of affairs is not limited to a small scope of country, but seems to prevail over several counties at least, in this part of the State.

One of the results of our scant summer pasturage is that our bees are practically non-swarmers, especially in large apiaries. Another result has been that, having little honey in the hives in summer, a drouth or a cold spell has usually made feeding necessary. Of late years summer feeding has been the rule, requiring some seasons as much as five barrels of sugar. Fortunately I have never been obliged to feed for winter, and have failed to get some surplus

but twice in 25 years. My surplus for the past five years has averaged annually only about 15 lbs. per colony of extracted honey. I have reduced, in the past three years, from 300 colonies down to about 140, without much effort on my part until last fall, when I brimstoned 55 of the least valuable of the colonies after extracting the honey. By this arrangement I can realize something from the sale of the honey extracted, and from the emptied combs.

While this may not be regarded by bee-keepers as the most desirable way of retiring from the business, it seems to have some advantages over the more common way of letting the bees starve and the moth eat the combs.

Farina, Ill.

[Certainly this is not "painting the business in too rosy colors," but it seems to me brimstoning is both wasteful and unnecessary. It would be far better to offer bees, hives, fixtures, etc., way down cheap than to resort to the primitive brimstone. "No one to buy," you say. Advertise, and find some one. Friend A., in a private note, says he is going to sell the combs after extracting. But, dear me! it is a sad state of affairs if the bees, hives, honey, and combs together are not worth more than just the honey and combs alone. Say, Bro. A., before you brimstone any more, try an advertisement offering full colonies, including hives, cheap. If the "ad." doesn't pay we will remit the charge. —Ed.]

## MANUM IN THE APIARY.

LEATHER ITALIANS; NEW VARIETIES OF POTATOES; THOROUGHbred CHESHIREs, ETC.

By A. E. Manum.

Returning home from one of my out-apiaries just as Dan (my helper) was coming out of the house from his dinner, I saw a strange carriage in the yard, when I asked:

"Dan, whose carriage is that?"

"It belongs to a young man who arrived just as I was sitting down to dinner; and as Fred took care of his horse, I did not learn who he is. He and Fred are now at the table. I think he is a bee-man, judging by the conversation I heard between him and Fred."

"Well, then, Dan, you may take care of my horse if you will, and I will go right in. You may unharness Daisy, as I probably shall not go to another yard to-day if this man has come to see me. . . . Well, well! Walter Larrabee! I am surprised, truly, to see you in Bristol—not only surprised, but greatly delighted. It is not often that I have the pleasure of entertaining the president of the Vermont Beekeepers' Association."

"Thank you, Manum. You see, since we are unable to get you out to the conventions of late, where we can learn what you are doing in the bee-business, I just thought I would take a drive out here and interview you at your home."

"That is right, Walter. Here is where you will find me every day, right at home or at one



"WHEN! MY SAKES! WHAT A SMUDGE IT MAKES!"

Murphy's  
New York

of my apiaries. But I have so simplified the work with the bees now that I give my out-apiaries but very little time compared with what I did formerly. From three to six or eight hours per week is all the time I give each out apiary now. I find I can do as much in three hours now as I once could in a whole day—that is, I can accomplish as much."

"I suppose, Manum, the reason for that is, you have changed your methods somewhat, and do much less needless work."

"Yes, Walter, I am forced to do as little work as possible, in order to make the rounds. But the fact is, I have simplified the work so much in all of its branches, that, were it not for the other branches that I am carrying on—such as fruit, poultry, swine, and seedling potatoes—I could care for a much larger number of colonies."

"Yes; I heard you were doing quite a little in small fruit, garden truck, and poultry; but I did not know you were interesting yourself in originating new varieties of potatoes; and, really, I should never have thought of your going into the swine-breeding business. How many have you now, and what breed have you?"

"I have only 40 head now, as a starter, and am breeding thoroughbred Cheshires. I am doing it more for the fertilizer I shall get than the profits from the meat or from sales of breeding-stock. I find that berries require very rich soil to do well, and I therefore thought I would try the experiment of making my own fertilizer rather than buy it. As to the seedling potatoes, I have done quite a bit of that work one time and another; and although I have brought out some very fine varieties, I never pushed any to the front until last spring. The few varieties that I now have are proving so very remarkable that my friends who have tested them advised me to push them. I enjoy such work so much that I make crosses every year; but it is only occasionally that I get a good choice variety of potatoes from the thousands and thousands of seeds I save from the potato balls and plant."

"Dear me, Manum! it makes my head dizzy to think of all this. How in the world can you do so much with so little help as I see about?"

"Oh! by working *every day*, from daylight until dark. Let me tell you, Walter, when a man is doing such work as he enjoys, he does not mind the long days; in fact, my experience is that sometimes the days are not nearly long enough. Wife says, if I had the power that Joshua had, when I get to experimenting, there would be no sunset. Now, Walter, we will adjourn to the apiary."

"Yes, I want to see 'Manum in the apiary,' and the leather-colored Italian bees."

"Just wait a moment, Walter, while I get my smoker, and I will open a few hives."

"Hurrah! you have one of the Crane smokers, I see. How do you like it, Manum?"

"There, there! how do *you* like it, Walter?"

"Whew! my sakes! what a smudge it makes!"

"Yes; when I want lots of smoke, nothing will produce it equal to a Crane smoker. The only fault I find with it is, that it is a little heavy. It is so much larger than my old one that it seems a little awkward to me; but I am getting used to it. When I first got it it would not work at all; hence I did not use it for a long time. Finally I took it all to pieces and fixed the valve, and now it works all right. I think Mr. Root ought to be more careful about sending out imperfect work."

"Are these bees your leather-colored ones? They look rather dark."

"Yes; these are pure Italians. This is one of my best colonies, from which I propose to rear queens another year. There is the queen. You see she is large, thick, and stocky. Such a queen will produce large hardy bees, as you see here. Just notice their long broad wings."

"I don't see where you raise your queens, Manum. I see no nucleus-boxes around."

"No. I have not used any this season, as I raise all my queens in and over full colonies. Here you will see how I do it. First, my queen-cells are all built in full colonies, and at the proper time they are cut out and placed in these little queen-cell cages, which I call my queen-nursery. When one hatches she is introduced into one of the apartments here, over a full colony. I take a half-depth brood-chamber, divide it into four apartments, or nuclei, tack a sheet of wire screen on the bottom, and place it over a full colony. Each apartment is given three combs and a few bees, which forms my queen-breeding apartments. In this way I economize heat, thereby getting better queens, which are fertilized younger than in a little box by themselves."

"I am sorry to have you go so soon. I only wish you would stay all night. You will please give my regards to your good father and mother, and to your brother John when you write him."

Bristol, Vt.

[A few of last year's pattern of valves went out defective; but now every smoker is inspected by our apiarist before it goes out. Besides, the new form of valve is more perfectly constructed.—Ed.]

## BEE-PARALYSIS IN FRANCE.

A CRITICAL EXAMINATION OF THE SUBJECT,  
CONDUCTED BY

Ph. J. Baldensperger.

We never had any trouble with bee-diseases in the Orient, and I am wholly ignorant of what foul brood looks like, except from accounts read in books or bee-periodicals. Consequently I was never troubled, and so have not examined the matter. Last spring a case of bee-paralysis

presented itself, and I was quite puzzled to make out what it was. I will relate the whole of my experience as I noted it down during nearly three months.

I sold a hive to a gentleman about two miles from my apiary, in July, 1893. The hive was put on his premises, very near the sea. The queen was an Italian, crossed with an Algerine drone. In October, '93, the bees gathered about 30 lbs. of surplus honey from a kind of *Rosaca*, so I took about 20 lbs. In January, 1894, I visited this hive, and another of my own which I had also put up very near the sea—but a mile apart. They were both in fine condition. I had no time to look at them till March 4th. Then they were getting on wonderfully. But I noticed at hive No. 1 (the one I had sold) numbers of dead bees in front. I took up the most of them—weighed them, and found about 5000 dead bees. The hive then had nine frames of brood. I could not make out what the trouble was. A cold east wind had blown a few days previous to my visit. The alighting-board was out of place, and the neighboring pine-trees had strewn the ground with yellow pollen, looking like sulphur. I supposed death came from one of the above-named causes; but I asked Mr. G—, the owner, if he had anybody round about him who might have poisoned his bees. His answer was in the negative. March 19th I revisited the hive, to find, to my great astonishment, only six frames of brood and about 3000 dead bees. I watched the bees then very closely, and found some flying readily, while some dropped in front of the hive or on the alighting-board, with the body as full as a well-filled bee can be; but it simply remained there as if stunned, and died outside the hive after vain efforts to enter. The bees in the hive did not like to receive the weak ones, or those showing signs of the sickness—i. e., an unsteady gait and a swollen body. I could now only say that something was the matter, but not what. I examined all books treating on “bee-diseases;” found the nameless bee-disease, bee-paralysis, and the *Maikrankheit* (May sickness) of the Germans. Witzgall says the disease disappears after a heavy rainfall. I watched this, as it resembled it in many respects, but not in all; namely, it did not come on in May, and did not go after several heavy rainfalls. I wrote to Mr. Thos. W. Cowan, who advised me to treat with naphthol beta, but said, at the same time, that it is never so serious in England as the case reported. Meanwhile a “fixiste” (we so call the old-style bee-keepers in France) reported a case that occurred several years ago, and attributed it to the bees having sucked the sulphate-of-copper solution which they sprinkle on the vines, in search of water. This did not hold good, as the bees in No. 1 had plenty of clean water in the vicinity, and the sprinkling business was not then carried on. We looked for a poisonous plant, and found the *Euphorbia den-*

*droides*, a plant growing north and south of the Mediterranean, and used in Algeria to intoxicate fish; but after several hours in roaming about the mountains I found one single bee, which did not stop long enough to let me examine; besides, this suggestion did not hold good, as the plant also grows near my home apiary and other out-apiaries.

On the 5th of April Mr. G. wrote to me, saying his neighbor sprinkled his rosebushes with the above-named sulphate, and he believed that to be the mischief. Finally, on the 11th of April I had the hive brought to my house, and I put it among several other hives on the house-top, where we have a flat roof. On the same evening I counted 205 dead bees. April 12 I counted 240 dead bees in the evening; April 13, 250 more in the evening; April 14, 240 more in the evening.

It seems to me that the young bees hatch as fast as the old ones die; for since March 19 the six frames of brood have kept going.

April 15 I counted 240 dead bees. April 16, rain all day. Dead bees are still being thrown out and washed away. As often as I go there I could gather about 150 dead bees. The excrements are dark yellow, and the bees void these with great difficulty. Evidently it is a bad case of constipation.

April 17. I am testing Witzgall's sayings—241 dead bees—and all about the neighborhood dead and dying bees of this hive are found. Who can tell how many die daily far away?

April 18. About half a dozen were thrown out last night. Rain again all day, so that I can not examine.

April 19. Fine weather—no dead bees till 8 o'clock. Alas! again 240 by night.

April 20. Seven dead bees this morning—only 97 dead all day. The bees seem to be getting better; took a frame of brood and gave it to hive No. 85.

April 21. This morning 13 dead; 200 during the day; rainy.

April 22. At 9 o'clock this morning, about 50 dead. The bees are remarkably active in getting rid of the dead, and they carry them far away, so I can no more count the real number of dead; still 6 frames of brood.

April 23. Cloudy; 54 dead gathered.

April 24. Cloudy; 125 dead gathered. The frame given to No. 85 has no effect on the bees of that hive. The disease is not contagious—at least, it does not extend to the brood, if this disease is the “mucorine,” described by Witzgall.

April 25. Cloudy; 102 dead bees.

April 26. Inside the hive it looks pitiable, although they keep up six frames of brood, the mother laying continually. The bees now cover only the six frames; and in spite of the daily births, amounting to about 800, the hive has lost nearly 3000 bees, or 250 daily. The births are equivalent to what was lost on the flight. There is no more fall honey left in the hive,

which we suspected also. The bees now seem too weak to keep the hive tidy. They empty their fæces in the hive. I transfer them to a fresh hive—bees, frames, and all. About noon I counted 303 dead bees, inside and outside; from noon to nightfall, only 7, having no more honey. I presume the disease germinated in the food.

April 27. Cold and windy; 35 dead bees.

April 28. Again I change the hive; found inside about 385 dead bees; fed them honey and salt and naphthol, just enough to give the honey a taste; took again 38 dead bees.

April 29. Found 23 dead bees this morning. The bees seem vigorous, the disease going; at noon, 97 dead; evening, 25, thus making 145 dead to-day; fed again naphtholined honey.

April 30. Counted 33 dead to-day.

May 1. Counted 165 dead to-day. The disease is not going at all.

May 2. About 20 dead this morning; is it increasing? 143 by night; exchanged two frames of brood with No. 106, Algerian, to see if the disease is contagious or in the brood.

May 3. Counted 43 dead bees.

May 4. Counted 35 more dead bees to-day.

May 5. Counted 53 dead bees.

May 6. Counted 54 more dead bees.

May 7. Mortality is going on. The mother is laying, and is a beautiful insect, still keeping up her six frames—no progress and no decrease; fed 2 lbs. of salted honey—boiled; counted again 254 dead bees strewn about, not counting the numbers the bees carry away without control; bees hatching in No. 106; no disease spreading; in No. 85, given April 20, the bees are healthy; took away the mother of hive No. 1.

May 8. Counted 240 dead; May 9, 27; May 10, 54; May 11, 63; May 12, 20; May 13, 15. Divided the hive in two; plenty of cells. May 14, counted 10 dead. Bees build a piece of drone comb. May 15, counted 10 dead bees; May 16, 9; May 17, 5; May 18, 4.

The divided colonies seem better than before. Is it because of the division? Bees of both hives are gathering orange-blossom and pollen. The bees given as brood to No. 85 on the 30th of April are at work, without having communicated the disease up to date: bees at work there several days. Hive 106, which received two frames of brood May 2, which has been working since the 16th, show no disease; but the exchanged bees of 106, in the diseased hive, have been at work since the 14th of May, and *show signs of the disease*—consequently I can say the disease is contagious, but only from adult and field bee to adult and field bee.

I received GLEANINGS for May 1, 1894. Ramblor relates, on page 371, very much the same thing I experienced here. Mr. Douse says that there the yellow bees are apt to have the disease. He is right so far. A Palestine colony far away from the diseased one and from the experiment hives has the disease, but to a very

slight extent. Mr. McFadyry believes that the drones propagate the disease. I have not tried that. The diseased hive had drones in March, but has lost them all now. They died almost immediately after the division of the hive, on the 13th and following days. I read in GLEANINGS that it is worse than foul brood. The disease is different with us. I tried every way to communicate it to other hives. It is not contagious. The four hives standing a few feet apart have had nothing, and they have been standing side by side for more than a month.

May 19. Young queens hatch in both hives; the bees kill them all but one; no dead bees in either hive.

May 20. About a dozen dead early this morning; about 11 o'clock, rain; afternoon, gathered about 40 dead bees.

May 21. Counted 54 dead bees.

May 22. Counted 25 more dead ones.

May 23. Rain; no control.

May 25. Counted 25 dead bees to-day.

May 28. Counted 30 more dead bees to-day.

May 29, 30; June 1, 2—four days, no time to look after the bees.

June 3. Counted 50 dead bees; June 4, 25; June 5, 25; June 6, 15.

June 7. No more dead, and now the hive is finally rid of disease: took the hive up the Alps with the others. The bees in it could get some honey, but did not build up; still, it is well, and I sent it back to its owner in November. In December I revisited the hive: found it all right, in good condition: three frames of brood, and about 7 lbs. of honey; a population of about 10,000 bees.

The Palestine hive had the same, but much less extensively. I fed it with salt and naphtholined honey. It did not seem to affect it, either for good or bad. Not being at the house, I could not follow hive No. 1 daily; and, besides, the business of counting bees was next to impossible, as the ground round about was uneven, and covered with bush and herbs; but what I did, perhaps saved the hive. I picked all I could see—every diseased bee; for, besides the drowsy appearance and swollen body, the fuzz on the thorax falls away or is pulled off; anyhow, it was quite black, and the sick bee is easily distinguished. I kept picking them out every time I visited the hive, till there were no more left. The hive is again thriving with the others. With the same mother, they too gathered only their winter stores.

In conclusion, this is what I found: It was not the quality of the honey gathered in the fall; it was not exposure toward the sea; for another hive, placed near there, with the same plants to visit, and the same exposure, did not have any trace of disease. It was not want of food, as they always had plenty; the queen has nothing to do with the disease; the disease is confined to adult bees and fielders; they do not

communicate the disease to neighboring hives. The only thing I can suppose likely to have produced the malady is that the hives in question were too well protected against the cold—no airing on top, the sweat causing the mischief, the disease being communicated to only such bees as receive food from diseased bees, or such as pick up the faeces dropped inside the hive by diseased bees, thus acting like cholera, but only on such individual bees as touch the excrements.

I should be very glad to hear from our scientists. This is what I myself believe; but I may be altogether wrong. I have here given the facts picked up daily, and my thoughts thereon.

Nice, France, Jan. 5.

[In many respects the symptoms above given correspond with those of the same disease in this country; but it is a noticeable fact that they seem to vary under different conditions and in different localities. Mr. Baldensperger thinks the queen has nothing to do with it. The majority of testimony so far received seems to show pretty decidedly that she does.—ED.]

### BEE-PARALYSIS HEREDITARY.

A REPLY TO S. A. SHUCK.

By T. S. Ford.

I read Mr. Shuck's article on p. 54, and write to say that I am quite sure he is mistaken in his conclusion that bee-paralysis is not infectious; and I hope that you will adhere to the policy lately pursued by you in GLEANINGS, intended to induce queen-breeders to destroy all infected colonies. It is a step in the right direction. All the writers on this subject that I have noticed, who live in the South, like Mr. Getaz, of Tennessee, agree that it is a very serious disease. You know my reasons for concluding that it is infectious. It spread from a single diseased colony, purchased by me, to every colony that I had except two, in one season, assailing those nearest first, and then it extended from hive to hive as they were arranged in order on the benches; and to put the matter beyond peradventure, when I introduced a queen from one of my hives to a colony of blacks in my brother's apiary, bee-paralysis promptly developed with the appearance of her progeny, and this though she was, to all appearances, perfectly healthy when introduced, and the colony she came from had apparently made a perfect recovery from the disease. Following this, and after the robber-bees had cleaned out this hive, my brother had a well-marked case of the malady among his blacks; and, acting on my suggestion, he promptly got rid of the disease in his apiary by brimstoning the whole colony, since which he has had no more of it.

Mr. Shuck's article was very interesting to me, though I can not agree with his deductions. The truth is, so far as actual knowledge is concerned we are just where Miss Gayton and Mr.

Cheshire left us. We know that, back of the symptoms of the disease, as in the case of cholera, consumption, erysipelas, and other diseases of the human subject, there is a bacillus; but how this germ gets from one bee to another, we don't know. It is a matter for the microscopist. It is true, that the infection does not seem to spread readily from using, in a healthy colony, the combs from an infected one. My own observation in this respect is in unison with those of others as reported, with the exception that, finally, all of my colonies got the disease at last; but whether from infection communicated from the combs, or through diseased bees entering the wrong colony by mistake, or by means of robber-bees, can not be told. Considering the crowded state of the hive, and the close intercourse of its inmates, it is rather strange that the contagion does not sweep away the whole population at once. It is a fact, however, that many hives show a few bees having the first symptoms of the disease, that do not reach the worst stage. In many colonies, bees that are hairless and shiny can be seen with quivering wings, staggering about, that go all through the season without any great mortality. At this stage the guard-bees are still on the lookout for sick individuals, and they pull and haul them about and pluck their hair off until they are at last ejected from the hive and are too weak to return. But there comes a time when the disease becomes epidemic, so to speak, when the guards cease to hustle the sick, and the swollen, bloated bees begin to appear, and the guards have plenty to do to carry out the dead, who are normal as to color, but most of them enormously distended. At this stage the bottom-board is sometimes splotted with the yellow faeces of the sick. In cholera, typhoid fever, and other infectious or contagious maladies, the chief source from which the contagion spreads is the dejections. May it not be true of this also? The colony has invariably perished when this splotted condition of the bottom-board has manifested itself.

Mr. Shuck thinks that sour honey may have something to do with the production of the disease. It may aggravate it, but the real cause is the specific germ that can be derived only from some other infected individual. Harvey's maxim was, *omne vivum ex ovo* (all life is from the egg); and the same principle underlies the propagation of disease-germs. They do not generate spontaneously. Bees have been kept in this county since its first settlement, and there was never a case of bee-paralysis until my unlucky importation. Yet if there is any sour honey now produced in a natural way, it certainly was here before; but it never made bee-paralysis before. I hope you will stand fast in your position, and do what you can to protect the inexperienced from being the victims of some careless queen-breeder who thinks the disease a trifling one.

I have come to think that humidity may have something to do with the fostering of the maldy. I have two colonies that came near being exterminated last spring; yet when warm dry weather came on they built up rapidly and became strong enough to lay up stores for winter. With the wet weather we have had of late, the old symptoms have returned, and they are nearly as bad as ever.

We have had a good deal of steady cool weather so far, and there is not a flower to be seen; yet, going among my bees yesterday, Jan. 24th, they were seen bringing in immense loads of what appeared to be pollen of rather peculiar color. The same day a neighbor remarked that my bees were swarming on his cotton-seed meal, and then I recognized the peculiar color as that of cotton-seed meal. They certainly bring in the most enormous loads of it. I wonder if it will serve their purpose as well as pollen. I am going to buy some cotton-seed meal and give it a trial.

There is every indication that we are going to have a fine honey crop this year. There has been so much cold weather that it is almost certain we shall have no bloom killed by frost. It will take a month of warm weather to start the trees to budding, by which time we ought to be measurably safe.

By the way, a singular and most unfortunate thing happened in our neighborhood last fall. An unusual quantity of sugar-cane was raised, and the making of molasses lasted nearly three weeks, during which time the bees were drowned by the peck in the cane juice and in the boiling syrup. Our stocks were greatly reduced in numbers by this occurrence. If I live till next year I intend to close up the entrances with wire cloth during the grinding season.

I am going to try sulphite of soda in syrup, for bee-paralysis. It is said to be a good germicide.

Columbia, Miss., Jan. 25.

[And here is another article that seems to uphold pretty well the position of Mr. Ford.—ED.]

#### BEE-PARALYSIS PRIMARILY FROM THE QUEEN, NOT FROM THE FOOD.

I notice what has been written on bee-paralysis by different ones. In 1877, while in Milford, Wis., I bought a queen of an eastern breeder. She was very prolific, and produced fine bees. After her bees were two or three weeks old they would swell up and shake and tremble, and crawl about until they died. In the fall I added a small swarm to the diseased one, and next season she filled her hive with bees, but all the while they kept dropping off with paralysis. I reared six queens from her, and every one of them produced bees with paralysis. I let no drones fly from this queen, so all the young ones were mated with good drones. I sprayed them with salt and water many times; I also sprayed with a mixture of carbolic acid and water, but all to no purpose. All remedies failed. Some-

times there would be a pint of dead bees at each hive. I also noticed that, as the queens grew older, more bees died from each hive; and if I had not added frames of brood from other hives they all would have died. I kept them three years; and as I concluded there was no redemption for them I killed all the bees and queens, and put new swarms on the combs, and I have never seen a sign of it since; therefore I believe the fault lies in the queen, as no paralysis ever appeared from the combs where the bees had been killed. I do not think that sour honey has any thing to do with it. I have also learned from the queen-breeder of whom I got her that his whole apiary was affected with it, and that the drones from such diseased queens would show the disease in their progeny, even when they had been mated to a healthy queen.

Redfield, N. Y., Jan. 18.

J. R. REED.

#### BEE-PARALYSIS.

##### A CRITIQUE OF PENDING THEORIES.

By Dr. J. P. H. Brown.

Bee-paralysis seems to be one of those occult diseases whose etiology is beyond the ken of the bee-keeper. I have never, to my knowledge, seen a case of it, but I have read the writings of others upon the subject, with much interest.

In GLEANINGS, p. 54, this year, there is an article on the subject by Mr. S. A. Shuck, who advances the idea that it may be caused by poisonous, sour, or unwholesome honey. Now, Mr. Shuck's opinion may be considered untenable when placed by the side of so high an authority as Frank R. Cheshire, who considers this disease to be caused by a bacillus (*bacillus Gaytoni*, after a Miss Gayton, who first called his attention to it). He says these bacilli are not only in the affected workers, but also in the queen. If such be the case, then it becomes a more terrible disease than foul brood—harder to reach and more difficult to eradicate. Any germicide sufficiently powerful to destroy these bacilli in the workers or queen, by any admixture of food, would also either destroy these insects or impair their future usefulness; hence total destruction of every bee in the hive would be the only infallible remedy.

Cheshire's bacillus theory has given rise to the remedy of changing queens. This course seems to have worked with some satisfaction with a few of the reporters of this disease to the journals, while others have reported that they could see no benefit. Mr. O. O. Poppleton, a very intelligent bee-keeper of long experience, reports in *The Bee-keepers' Review*, p. 267, that he "changed queens, with no result." If Cheshire is correct in his observations upon bee-paralysis (in many other instances he has not been infallible), then, let me ask, what benefit does the infected hive receive from a change of queen? The infected workers are still in the

hive, and they would soon communicate the bacilli to the introduced queen.

Mr. C. W. Dayton, a correspondent of the *Review*, p. 272, from Florence, Cal., observes, when speaking of queens in hives affected, that "in every case I have seen, the queen was an unusually prolific layer." Mr. O. O. Poppleton says, "My nuclei with young perfect queens have suffered much more than old colonies with old queens." Now, how can the idea be entertained that a queen whose ovaries are infested and swarming with *bacillus Gaytoni*—whose vitals are being continually preyed upon by microbes—can be "an unusually prolific layer"? The idea is absurd. It would be just as rational as to suppose that a person infested with the spores of yellow fever, cholera, consumption, etc., would be physically able to perform a full day's work.

Mr. Poppleton says, "It is an exceedingly erratic disease. At times it seems to follow no rules; at other times it works in well-defined limits." Mr. Getaz remarks, in *American Bee Journal*, that "the malady is much worse some years than others, and generally much worse in the spring." Mr. Dayton says, "It usually attacks a colony about the time it gets populous enough for the surplus-receptacles." Mr. T. S. Ford observes, in *Review*, p. 240, that "the disease does no harm except in the spring and during the honey-flow. At that period the bees die in such quantities that I have seen as many as a peck of dead ones in front of a single hive. When warm weather sets in during June it disappears in nearly all the colonies, and only an experienced eye can detect it."

Sifting the various reports of the disease as given in the bee-periodicals, they all show that the symptoms of the disease vary very much during the season—at one time being very prominent; at another, scarcely if at all perceptible. These erratic conditions of the disease are incompatible with the theory of *bacillus Gaytoni*, and we must look elsewhere for a cause.

Mr. Shuck, the gentleman already quoted, says that, from his observations, he concludes "that, in some instances, this disease is the result of a poisoned condition of the honey," and that the poisoning results from incipient fermentation—not that all honey with a slight tendency to ferment is injurious to bees, but that honey in this condition will readily absorb the poisonous effluvia from dead and decaying bees or other decaying matter in the hives. Then, too, I believe that, in many instances, the honey actually becomes sour enough to cause the disease; and I fear that this is the trouble in warm climates such as that of California and the Southern States." These conclusions of Mr. Shuck are worthy of some consideration by the scientific bee-keeper; for, if the symptoms of this disease are carefully studied, they seem to point to some poisoned condition of the food

taken by the bees—it might be either honey or pollen, or both—rather than to the theory of bacillus.

We know that every kind of plant and vegetable, when in certain condition, is liable to be attacked by the spores of fungus. We know that the grape, the peach, the potato, etc., are more subject to rot in some seasons than in others. In favorable atmospheric conditions of a week's duration the fungus may develop, and the disease show itself; while with a change of conditions the disease may check or disappear. In the Report of the Department of Agriculture for 1886 the mycologist of the department observes, when speaking of fungi, that "the fungi which infest our cultivated plants, and not infrequently cause their total destruction, vie with the insect tribes in numbers as well as in the extent of the losses they occasion; and in the transformations they undergo in their development they are equally complex and often more difficult to follow. They are, for the most part, so small, and the metamorphoses they undergo are so obscure, as to call for the greatest amount of patience, and the closest study, in order to obtain any satisfactory knowledge of their natural history; and in spite of all our efforts there will frequently remain many points which must be left to conjecture. That these fungi which make themselves manifest in the plant-diseases known as 'rust,' 'smut,' 'mildew,' 'blight,' etc., are true vegetable parasites; that they are governed by the same laws which control all living organisms; and that they are propagated by specially developed reproductive bodies called spores, are fundamental truths to be kept constantly in mind in studying this subject."

These spores are conveyed by the air, and only await congenial conditions for development. They would be as liable to attack the pollen or nectar secretion as any other part, if the conditions favored, and then be carried by the bee to the hive, in the shape of diseased food, to breed sickness to the inmates.

In many portions of the South there are large plantations of melons that are grown for the northern markets. It is not unusual to find on these grounds hundreds of broken, rotten, and decaying melons, swarming with bees sucking the fermenting juice that is teeming with the spores of fungi. The effects of such rotteness on a hive of bees I can only conjecture. To say that the instinct of the bee is always sufficient to discriminate between what is wholesome for it and what is prejudicial, is all nonsense. They often visit places that are not overly nice. They will often visit poisonous flowers, for instance, the *Gelsemium sempervirens*. In GLEANINGS for Jan. 15, Prof. Cook refers to a tree in California—*Eucalyptus rostrata*—that is very fatal to bees. I admit that the bee will swerve from the dictates of its instincts only from necessity and not from choice.

I have penned the above to elicit thought, and to prompt observation. Our experiment stations should take up the subject: it is a field for the scientist. Scientific observations should be conducted at different points, and notes compared. This is the only satisfactory way to determine the cause of the so-called bee-paralysis. Augusta, Ga.



### PUTTING SECTIONS INTO T SUPERS.

A GREAT IMPROVEMENT OVER THE OLD WAY.

*By Emma Wilson.*

It is about the time when a good many bee-keepers get ready for the year's crop, and a pretty good time to discuss ways and means. I have spent a good deal of time, first and last, in filling sections into T supers. I thought I had become quite adept at it. As I put the foundations into the sections, I piled the finished sections one above the other on a board, until I had put on as many as it would conveniently hold—about a hundred, I think. Then I would set it to one side and commence on a fresh boardful, until I had a good many hundreds piled up in that way. Then I would have to stop, and commence putting them into the supers. I never enjoyed that part of the work very much. Some way it always seemed like so much lost time. Once in a while a boardful would come to grief by being upset all in a heap, and it would require some patience to straighten things out again.

When supering I would put the super on a table of convenient height, put the T tins in place, and, by taking two sections in each hand, could fill one row across the super at a time. I really didn't see how there could be very much improvement on that plan of filling a T super.

One day as I was putting in foundation Dr. Miller stood watching me, and wanted to know why I didn't put the sections directly into the super instead of piling them on a board. I told him I had tried it a good many times, but it was very slow work. The T tins would not stay in place; and even if they did, it took too long to fit each section in place. I could set them down on a board much more rapidly. He replied, "I believe I can fix it so that you can put them into the super just as rapidly as you can set them on the board."

□ Now, I had a good deal of faith in Dr. Miller's ability to make the work very much easier, for he has a genius in that direction; but my faith was not quite strong enough to imagine he could fix any arrangement by which I could place those sections into that T super as rapidly as I could place them on a board. But he

did. If he did not quite revolutionize bee-keeping, as the stock phrase has it, he certainly did, in my estimation, revolutionize filling the T super.

He took a board as wide as the super, and a little longer, and nailed a cleat as long as the width of the board, an inch wide and  $\frac{3}{8}$  inch thick, on one end of the board, to push the super against. Two inches from this cleat he nailed a strip  $11\frac{1}{4}$  inches long,  $\frac{1}{8}$  inch thick, and  $\frac{1}{4}$  inch wide;  $4\frac{1}{4}$  inches from this last strip, measuring from center to center, he nailed another strip the same size, and still another strip of the same size  $4\frac{1}{4}$  inches from the last. That made three of these little strips. He nailed three other strips  $2\frac{1}{2}$  inches from these strips, measuring from center to center, these last strips being  $11\frac{1}{4}$  inches long by  $\frac{1}{4}$  inch square. That made the board complete.

I placed this board on a box 20 inches high, at my right hand, one side of the board toward me, with the cleat at the back end. Over this board I placed this super, pushing it tight up against the cleat. As fast as I filled the sections with foundation I set them in the super. I first filled the row of six sections at the back end. It was no harder to set them there than it would be to set them on any flat surface, for you understand that, as yet, there was no T tin in the super. Now I put in the first T tin, slipping it under the whole row of sections at a clip, and do it more easily and quickly than I could have done it had there been no sections there. The sections being raised  $\frac{1}{4}$  inch gave plenty of room to slip the T tin under. Now I put in the second row of sections and the second T tin, then the third row of sections and the third T tin, and, by crowding the T tin up tight, it gave me plenty of room for the fourth row of sections. When I lifted the super the sections all settled down in their places.

I can not imagine how sections could be put in more easily into any kind of super.

Marengo, Ill., Feb. 11.

### WINTER IN FLORIDA.

JACK FROST AMONG THE ORANGE-TREES.

*By Mrs. L. Harrison.*

Mr. Editor:—"The sunny Southland, with its sweet warm air and land of flowers," has been a misnomer during this winter. We have just passed through a severe cold storm, accompanied with snow and sleet. As I sit by the table writing, and look through the windows upon the piny woods, a beautiful vision greets my eye. The tall pines, with their green branches, are decorated more beautifully than any Christmas-trees in festive halls. Their proud heads, crowned with sparkling diamonds and clear transparent prisms, are a thing of beauty, to be enjoyed once in a lifetime. There

a great white sheet of snow is loosened, and slides gracefully to the ground; yonder, a great green limb is broken from the tree by its great weight of snow and ice, and comes down to the ground with a crash.

In the early twilight of the night of Feb. 14, the large feathery flakes of snow began to descend, and fell upon the people gathering at a hall to celebrate the festival of St. Valentine. The snow was a great novelty to the young people, born and reared here, for they had never seen before more than a few flakes that melted as they fell. It continued to fall until it was three inches deep, and balls of the beautiful snow were brought into the hall, and were a source of much fun and merriment. Tiny balls were tossed at each other, in great good humor and pleasantry.

This is the third time during the winter, when there was freezing during several nights, and all winter gardens were destroyed. A few days previous to this last storm I was delighted in watching a very large colony, sailing in with heavy loads of light lemon-colored pollen, gathered from the tyty. The sweet-scented bloom of the tyty thickets yields much white honey. Many colonies have died of starvation in this locality, and more will probably follow, as this last freeze will cut off the bloom for some days.

St. Andrews Bay, Fla., Feb. 15.



#### BEES MOVING IN THE CLUSTER.

*Question.*—A neighbor tells me that the bees during winter are continually moving from the outside to the inside of the cluster, that they may have access to their honey. Is such the case?

*Answer.*—This story of your neighbor is one that has been told a great many times, and is based on the very reasonable supposition that each individual bee must help itself to honey directly from the cells containing the same. But, reasonable as it may appear, I am led to believe that the story has no foundation in fact. I have just been in the bee-cellar to see if I could see any thing of the kind going on, and I have to report that I do not. Some of the colonies have bees hanging below the frames to the amount of one-fourth of a good sized swarm, at least; and if such changing for honey was going on as has been supposed, certainly now and then a bee would be crawling in after honey, especially as the lowest bees would have to travel some five or six inches up through or over the cluster, to get where the honey is. But I see nothing save a big cluster of nearly or quite motionless bees, hanging and overlapping each other—each one, or nearly so,

having its head under the body of some other bee. Of course, it is impossible to see or know just exactly what is going on inside of the cluster of bees during winter; but I had always supposed, and so believe now, that bees give honey to one another; that is, the bees which are near the honey give to those under them, and these to those next further away, and so on till the last bee is reached, and the very bottom outside of the cluster. Bees are continually passing honey around during the summer, and why should they not do the same thing in winter, when it is more to their interest to do so than in summer, when all can go about as much as they please? I am aware that these things are of minor importance; but I have always believed that it is better to be informed on all the minutiae of bee-keeping than to pass any thing by as non-essential, as such a course allows us to easily drop some important point which would otherwise be brought to light.

#### REMOVING POLLEN FROM COMBS.

*Question.*—Having some combs stored away, left from queenless colonies last summer, which are pretty well filled with pollen, I should like to know how I can remove the same before I give the combs to the bees. Will you please tell us in your department in GLEANINGS how it can be done?

*Answer.*—Most assuredly I will tell you; for, did I have those combs, I should consider them worth almost if not quite as much as though they were filled with honey. The very best way of removing such pollen is to insert one of those combs of pollen in each hive having a prosperous colony of bees in it, in the spring; and if you have enough of those combs to go around you can consider yourself lucky. They should be put into the hive next to one of the outside frames of brood, and the work should be done in early spring on some warm day, before the bees procure pollen from the fields. This will save you all necessity of feeding your bees rye or wheat flour, or corn or oatmeal, and will be of more advantage to the bees, as it will give the pollen right where they wish it, and save the loss of bees which usually occurs from their going out in cool windy weather in search of pollen. It has been recommended scores of times that we feed our bees flour or meal in the spring, to stimulate brood-rearing; but after years of experience along this line I have become satisfied that such procedure is a waste of time and material, where the bees have pollen in the hive, and causes a loss of old bees to a greater extent than that gained in young ones. Thus you will see that these combs are very valuable for early brood-rearing, before pollen is plentiful in the fields. If you are so situated that your bees can secure pollen from the fields as soon as they can fly in the spring, so that you can not use the combs to advantage as above given, the next best thing to do is to

give one of them to each new swarm when hived. In this way the swarm is spared the pains of searching for pollen, and can devote all its energies to gathering honey; and in a few days you will find your pollen all turned into brood, if you open the hive and look. But should you not desire to use either of these plans, then I would either soak the combs in tepid water for a week till the pollen in the cells became soft so it could be thrown out with the extractor, or I would cut the combs out of the frames, melt them up, and fill the frames with comb foundation. Should you do this last you will have to render the wax from these pollenized combs by the hot-water process, or you will not get enough wax to pay you for your trouble, as the pollen in the combs will absorb all the wax, or nearly so, if they are melted in the solar wax-extractor.

#### MOLDY BROOD-COMBS.

*Question.*—I fear, by the appearances of things, that I shall have some moldy combs in the spring, as my cellar is very damp, and I can smell the moldy combs already. What will be best to do with them in the spring, should any be very moldy?

*Answer.*—We will hope for the best, thinking that your fears may prove unfounded. But should the combs come out moldy, probably not more than one out of four or five will be very bad. Those which have but little mold on them can be left on the hives, where they will soon dry out, and the bees care for them so they will do no harm. If any are from one-third to covered all over with mold, it is well to take them from the hive and hang them in some dry airy room till they are thoroughly dried out and needed by the bees. Don't attempt giving them to the bees while they are all wet and slimy, for nothing seems to so discourage a colony of bees as nasty, wet, moldy combs. When they get all dry, and your bees are needing more combs, take them down, and, with a rather stiff brush-broom, made from broom corn, brush them off thoroughly, but not hard enough to break the cells, when you can put them into the colonies one at a time, and the bees will clean them up so nice that, should you look for them two days after, you could not tell which they were unless you marked the place where you put them. It is best not to give any colony more than one at once, unless the colony is a very strong one. In two or three days give another, and so on till you have them all in the hive. I never yet saw a comb so badly moldy but that the bees would make it as good as ever, if the above plan was followed. Some say, melt up such moldy combs; but so far as I have tried they give very little wax when melted by any process, and none at all when melted in the solar wax-extractor, as the fiber of the mold absorbs what little wax remains.



#### FISH-KEGS THE BEST PACKAGE FOR EXTRACTED HONEY, AND WHY.

In your last issue of *GLEANINGS*, page 129, I noticed a controversy concerning the best and most practical package to put extracted honey in. If the parties had to transfer a hundred barrels into 150-pound kegs to fill orders that could not use barrels, or if they did, at a much reduced price. I think they would agree with us that the best all-around package to sell extracted honey in, in quantity, is the 150-pound pine fish-keg, costing only about 30 cents, making it the cheapest package; and, holding only about 150 to 160 lbs., it is within the reach and requirements of the small retail dealer who has not the money, facilities, nor room for handling the large barrels; and a great portion, especially of the dark and buckwheat honey, is sold to the small retail Polish Jew dealers who dispense it in small portions to their customers, who use it largely to make an intoxicating drink.

The coldest day of last week we received an order for fifty 150-lb. kegs of extracted honey, and we had to transfer it from molasses-barrels into these kegs, or lose the order. It was no easy job, as, of course, we had to do it without heating it in any way, which we have a way of doing quite rapidly, but it necessitates extra cost of kegs, some waste, and requires a lot of patience.

H. R. WRIGHT.

Albany, N. Y., Feb. 18.

[I knew your market preferred the kegs; but in other localities the barrels seem to be none too large. I sincerely hope that the demand for honey to be converted into mead or hydromel will not increase.—ED.]

#### THE SWEET-CLOVER PLANT; IMPORTANT TO TANNERS.

It may surprise many to learn that the sweet-clover plant is of immense value to tanners of leather. A practical tanner, an expert in his profession, assures me that the fraternity can richly afford to pay 10 cts. per lb., or \$200 per ton, for the sweet-clover plant when properly prepared for their use. A number of years ago this tanner offered me about 5 cts. per pound for the plant if I would supply him with it, and prepare it as per his instructions; but at that time I did not care to bother with the matter. There may be some practical tanners, or some who may know more or less about tanning the skins of animals, among your readers. If so, and if they should wish to know how to use the sweet-clover plant, as indicated, perhaps I can supply the information. The leather thus made is said to be of superior quality—in fact, when made with japonica and sweet clover, it is equal to that which is

commonly produced from the best quality of oak-bark.

M. M. BALDRIDGE.

St. Charles, Ill.

#### FINDING BEE-TREES IN WINTER.

It may interest the readers of GLEANINGS to learn how to hunt bees before the snow is off the ground in the spring—especially those who live near large timber. It is well known by all persons conversant with their habits, that, after a long confinement, the bees will improve the first good opportunity to have a general fly. Such an opportunity almost always comes toward spring. There comes one or more very warm days the last of February or first of March, and the bees are out in force, so to speak. Now is the time to look for the bees that either get chilled, snowblind, or, perhaps, from age and debility, fall to the snow and are unable to rise. You may find some, twenty or thirty rods from their tree. But as you get nearer you will find them more plentiful, and immediately under the tree you will find the snow stained, so that it is not a hard matter to locate them.

Bees falling on the soft snow will soon sink by their natural heat, so that it is essential to look, at least before there is any more snow falls; and the sooner after their fly, the better. I found three trees last winter, or spring—the first two by finding the dead bees as above stated, and the third by seeing them flying on a warm day, although the snow was a foot or more deep in the woods. The first one found was a basswood, the second a butternut, and the third a large hard maple. I am satisfied that bees have but little choice as to what kind of tree they go into. I have found them in nearly all kinds of wood. I now call to mind that I have cut 8 pine bee-trees, five hemlock, three basswood, three maple, one elm, and one butternut. If they go into one kind of timber more than another it is because there is more of that kind within their reach.

Sullivan, Pa., Jan 17.

A. DEWEY.

[It would look as if winter, or the latter part of it, were just the time to find bee-trees. When found they can be marked, and, later, can be taken.—Ed.]

#### FEEDING BACK—A PROFIT OF 50 PER CENT.

In GLEANINGS for Feb. 15th, friend Taylor gives about the same results that I have reached in feeding back. I have fed to finish up unfinished sections for the last three years, and I agree with him that there is a profit in it of about 50 per cent. Now about the work in feeding back: Come and see me and I will show you how to feed 200 lbs. a day, and not take over an hour's time to prepare the feed and place it where the bees can get it—no daubing, no robbers, and you can tell at a glance every day what colonies are in need of a new supply of extracted honey. Just let me whisper to you, that, during the one year that I kept track of every thing, I made \$5.00 per colony during the

month of August for each colony fed. That year I fed extracted honey to 9 colonies to finish sections, and I spent only about 15 minutes per day feeding. Results, \$45.00 for the month of August. This is nearly \$2.00 per day. Doesn't that pay?

My new bee-house is nearly ready for bees; and just as soon as possible I will get two or three photographs taken, showing the outside and the inside of the building.

Syracuse, N. Y., Feb. 18. F. A. SALISBURY.

[I am not only glad that Mr. Taylor proved himself right in our last issue, but that he has such a good man as Bro. Salisbury to come forward and substantiate his statements, over an independent route. As soon as the photographs are received the engravings will be made, and will appear in due time.—Ed.]

#### STOPPING LEAKY GUTTERS, ETC.; ALSO SOMETHING ABOUT "SANDPAPERING" GARDENERS AND FLORISTS.

For leaky gutters in greenhouses or cracks in wagon-hubs, mix any good paint and apply with a brush, and have some hot dry sand and pour in, and work it into the crack with the brush. That will dry and not shrink. If the crack is very large it may need two applications.

Sometimes my hands chap or crack. I find a piece of sandpaper will cut off the rough piece of skin, and cut down to where the skin is hard; and then a little glycerine will heal them up quick. I find the sandpaper excellent in reducing corns and bunions on the feet. I think it far superior to cutting them with a knife.

To kindle a fire easily we have a 3-lb. peach-can, with one end out. We put in an inch or so of coal oil, and put in six or eight corncobs point down. We take one of these and lay it in the stove where it can be lighted from the draft, then put in some kindling and wood; light the cob, and you have a fire in short order.

GEO. M. KELLOGG.

Pleasant Hill, Mo., Dec. 16.

Well done, friend Kellogg. Any man who has set glass on the modern plan, with thick putty and dry sand, ought to have known what a grand cement it will be for filling up cracks in any thing exposed to the weather; but I confess it never occurred to me before that gardeners and florists needed sandpapering more than people in general. Why, since you mention it I really believe the thing I have been suffering for for years is a good thorough "sandpapering;" and I rather think it ought to be done every little while. What a beautiful world this would be if all the rough spots and corners of so many queer and curious people were to get a good sandpapering regularly! Yes, we all need it more or less. And, by the way, old friend, making such a trip as I did, and meeting such people as yourself on the way, has (or at least I hope it has) knocked off or smoothed down a good many of the rough points in a naturally vehement disposition. Your corncob idea is a good one; and, by the way, if any of the friends should run short of corncobs, the State of Missouri alone can supply the world, and I shouldn't wonder if they would put in an extra shovelful to make good measure, if you will only mention it.—A. I. R.]



EIGHT extra pages this time.

IN spite of the extremely cold weather, reports so far indicate that bees are wintering well. This is indeed surprising. When we remember that cold winters are followed by early springs, usually, the prospect so far is encouraging.

O. O. POPPLETON, of Potsdam, Fla., writes that "the frost of last week has practically wiped out all the bee-industry on the east coast of Florida for the coming two or three years at least." This is rather discouraging, coming right on the heels of such a magnificent honey season as Florida had last year.

It is with much regret that I learn that Mr. S. I. Freeborn, one of the foremost bee-keepers of Wisconsin, and, I might say, of the United States, died suddenly at his home at Ithaca, aged 62. It seems that his health had been failing for some time, and some three or four weeks ago he contracted a severe cold, which resulted in pneumonia and death. Mr. Freeborn's name was first brought prominently forward before the bee-keeping world through the Bee-keepers' Union. It seems that his bees were declared a nuisance, and an effort was made to get them out of the town; but, as our older readers know, through the efforts of the Union, of which Mr. F. was a member, the case was finally decided in favor of the bees. This was its first victory. Mr. Freeborn was not a quarrelsome man—indeed, the very opposite. He was held in very high esteem, both as a neighbor, father, and a member of the community. His son-in-law is Mr. C. A. Hatch, so well known to our readers.

#### MIXED JOURNALISM.

THE *American Bee-keeper* has decided to adopt mixed journalism. The size of the paper is doubled, the new matter being of a literary character. The fact seems to be, that, in spite of certain criticisms that seem to break out here and there, the bee-papers that adhere *strictly* to the subject of bees do not enjoy the circulation of those that have added subjects foreign to bee-keeping. Not a few of our readers take GLEANINGS simply for its religious matter, and others for the gardening department; and from the numerous letters received, it is evident that, in many of the homes of our subscribers, GLEANINGS is the *only* paper taken. One man wrote the other day, saying the times were so hard he was obliged to drop even his church paper which he prized so much; but GLEANINGS he *must* have.

But why should objection be made when we add enough extra pages every year to make up very largely for the matter that is foreign to bee-keeping? During the early part of the year, our journal is enlarged all the way from 8 to 16 pages; indeed, this number has 8 extra pages. Let's see: Last year our volume showed a total aggregate of 968 pages, or an average of 40½ pages per issue, while the regular issue is 36. Some years our volume shows over 1000 pages.

A number of years ago we took a vote of our readers as to whether they would have the extra religious matter or not. The result showed that, of those who voted, there were about 100 in favor, to one the other way. This is a conservative estimate, too, and it is to be presumed that the rest not voting was represented by this proportion. These people who criticise our course in putting in religious matter and garden topics do not seem to be aware of the fact that they are in a very small insignificant minority. If they do not like those subjects they do not need to read them, or even take the journal at all, for there are very excellent bee-papers that confine themselves strictly to bees.

#### ADULTERATION IN BEESWAX.

BEESWAX, as you will notice by the markets, is steadily going up in price, and we are just about out, although we are expecting more daily—enough to keep going as usual. I said we are about out. We have got some "stuff," more than we wish we had, which we bought for pure beeswax, that is beautiful to look upon; and when we bought it, it seemed to stand all the tests for pure wax. It was analyzed, however, and found to be adulterated largely with paraffine. It is now on our hands, and we do not know what to do with it unless we make the parties who sold it to us take it back or stand damages; for we would under no circumstances use it for foundation. About 500 lbs. of the same wax was sent to M. H. Hunt, direct from the parties above mentioned, and whom we supposed to be reliable, *before* we suspected adulteration; but as he was on his guard he set it to one side, pending further investigation. Another lot was sent to W. A. Selser, of Philadelphia direct, on our order from the same parties; but it was found by him to be impure. Fortunately we had used but very little of this wax ourselves, and that little, fortunately, too, was mixed with a large lot of pure wax. Paraffine or mineral wax is a positive detriment in comb foundation, as we learned years ago. The bees will build it out beautifully, but it has a disagreeable fashion of melting down in the hive. Even foundation from pure beeswax does this bad enough at times, but nothing like the stuff made of paraffine. Mr. Selser is a little fearful that a good deal of the wax on the market is adulterated. That being the case, let foundation-makers be on

their guard. A large part of our wax comes in small lots from bee-keepers direct, and, of course, is all right.

*Later.*—Since writing the foregoing we have received a letter from Ch. Dadant & Son, from which we make the following extract:

We have received your sample beeswax, and must say that at first sight we should have been "taken in," for it smells and looks like pure beeswax. A careful test, however, by the alcohol and water test showed that it has a lighter specific gravity than average beeswax. We should like to ask you by what sort of analysis you found that it had been adulterated, and also who sold it to you. Such men should be spotted, so every one may beware of them.

We never buy beeswax that has been remelted, for the only time that we ever received such a lot we found it to be very largely adulterated—much more so, in fact, than the sample you sent us.

I will explain that we sent them a sample of the wax, stating that we had found it to be adulterated, and asked their opinion on it. The wax is so skillfully adulterated that very few experts would have doubted its purity, and it is not much wonder that we were "taken in."

We hardly like to give the name of the parties of whom we bought the wax yet, for it is not entirely clear that they were acting in bad faith. They declare that they bought the wax on sample, and sold some to us in the same way; but what we have been trying to find out of them is, who it is they bought of that is adulterating wax so skillfully that even experts are misled. It is presumable that the adulterators will be flooding the markets with these goods unless restrained. All foundation-makers should be on their guard at all events.

The chemist, under the instruction of Mr. Selser, our agent at Philadelphia, and without our knowledge, also analyzed a sample of our foundation—some Selser had left on hand. It was taken from our last year's stock, and, of course, was like all the rest we sent out last year. Well, now, this showed that it varied from 94 to 98 per cent pure. In view of the fact that pure beeswax will contain more or less impurity in the way of dirt, etc., and the further fact that chemical analysis can not be expected to reach down to fine notches, it is very gratifying indeed. Mr. Selser, in commenting on the above analysis, writes: "My estimation of the A. I. Root Co. is higher than ever; for I am satisfied that, if it is possible for you to get pure beeswax you intend to do so."

We are not afraid at any time to have our wax analyzed, and I feel very sure that the Dadants and Mr. Hunt have the same feeling regarding their own wax.

#### WHAT WE DO AND DO NOT KNOW ABOUT BEE-PARALYSIS.

It occurs to me that the subject of bee-paralysis has been discussed in our own columns as far as it ought to be for the present. Further experiments should be made by some of the ex-

periment stations, by some professor with plenty of money and a good microscope at his disposal. There are a few things that we know about bee-paralysis. We all agree, perhaps, that it kills bees; is virulent in some localities, especially hot climates, and harmless in others, or in colder climates; appears and disappears as it pleases; bees swell up, look greasy, crawl out at the entrance, show a trembling, and die in the grass; the discharge is thin and watery.

Now for the points upon which there is not an entire harmony of opinion: Is it contagious? is it hereditary? is it caused by bad food? can it be cured by the removal of the queen? by administering salted water? can it be cured at all by any known remedy? Answering the two first questions, I am satisfied in my own mind that it is both hereditary and contagious. Certainly, if we accept that view of it, it will be safer for all parties concerned.

It seems to me that our present knowledge of the disease is not sufficient for us to answer the other questions, and for that reason it is just as well to let the subject drop in our columns, for a time, at least, until further developments shall have taken place. While some are doubtless interested in the discussion of the question, a great majority, perhaps, would prefer to read something else.

#### WHAT HAVE WE LEARNED FROM THE DISCUSSION OF LARGE VERSUS SMALL HIVES?

If our readers are getting tired of this hive discussion, large versus small brood-nests, I wish they would send in their postals, letting us know. On the other hand, if you feel that you are benefited, and would like to see the subject discussed further, let us know that also. GLEANINGS is published to please its *readers* and not its editors or its special correspondents.

Let us briefly recapitulate some things we have learned in the hive discussion up to the present time. 1. There are more bee-keepers using large brood-nests than we were aware of. 2. Many more favor ten-frame hives in preference to the eight-frame than we supposed, although, if we could count the hands of those using the eight-frame hives and those using the ten-frame, I think we should probably find three of the former to one of the latter. 3. It seems probable to me, at least, that some are using too small brood-nests, say of eight-frame size, when they might possibly get better results with ten and twelve frame sizes. 4. In colder climates, especially where there is one main honey-flow in June and July, with very little fall-flow, the eight-frame size seems to be used most. In warmer localities, in many portions in the South, in Cuba, where the seasons are prolonged, and where there are months when the bees can gather honey, instead of weeks, as it is with us up here in the North, a large brood-nest of ten, twelve, and sixteen frame capacity seems to have the preference.

5. Instead of bee-keepers running from ten down to eight, as formerly, the tendency now seems to be from the small size to the large. 6. The double eight-frame hive of 16 frames is too large—since 12 frames seem to afford the maximum capacity for most localities. 7. Supply-dealers (pity the poor fellows) will probably do a lot of growling, because it will be a nuisance to keep so many sizes of hives in stock, (to say nothing of styles), each size necessitating special covers, special supers, special bottom-bars, and special honey-boards. How nice it would be, dear brother supply-dealers (let us draw high and weep) if every bee-keeper could use one size of hive, one kind of frame, one kind of every thing. But, no. There are too many notions that are at variance—too many localities with different resources; too many things in general, to make us all think and believe alike.

#### THAT BICYCLE-RIDE FROM TOLEDO TO MEDINA —HOW IT WAS DONE.

THE following is an editorial that appeared in the *American Bee-keeper* and will explain itself:

When we read of the long runs made by the Roots, A. I. and Ernest, on their wheels we almost turn green with envy. Such muscles, such endurance, are almost phenomenal—at least, so it seems to the writer when he reads in January 15th GLEANINGS where Ernest scored 109 miles in 9 hours, and the writer is a "century rider" too—in fact, the captain of a "century club;" but he doesn't take 109-mile spins in 9 hours for fun *very often*. Say, Ernest, did you measure that run with a cyclometer, or trust to the word of a "native"? or did you have a 30-inch cyclometer on a 28-inch wheel? Honest, now.

I did not suppose that I had made an extraordinary ride, or I would have mentioned some of the circumstances under which it was made. The lowest road record for 100 miles is something over five hours, I believe; and for the track for the same distance, considerably lower than that. It is, if I am not mistaken, quite a common thing for good average riders to make a century on good roads in eight hours, and yet my time was a trifle over this.

Bro. Merrill lives in quite a hilly State, and writes from that standpoint. The road from here to Toledo is practically a dead level, for it is not a great way, as you will see by looking at the map, from Lake Erie. There are but few hills, and they do not amount to much. Besides, about 30 miles of the road is macadamized; and along the whole distance the road is kept in fairly good order. Now, then, if Bro. Merrill will turn to a good reliable map of Ohio, he will find that a *direct bee-line* from West Toledo to Medina is about 93 miles—one map making it 91 and another 96. But it was impossible to take a road as direct as that. My route was through Genoa, Fremont, Clyde, Bellevue, Wellington, to Medina. Striking a bee-line from Toledo to Monroeville, and from Monroeville

to Medina, the distance measured by the map before me—not a railroad map, but one of Rand & McNally's—makes a total distance of 100 miles. But if you will trace the different towns that I went through, you will see that I had to vary from these two lines quite a little. And still more: There are quite a number of right angles that I had to make—due east and then due south, that, of course, would not show on an ordinary map. You will see, therefore, that the distance, 110 miles, is not far from right. But I did not get those figures from the map, but from the guide-boards, and we have them in Ohio at every corner. These made the distance a trifle over 110 miles. As to time, I carried a watch with me the whole distance, that never failed me, and the time according to it was 9 hours, not including stops for three meals of about one-half hour each. I have been over a large part of this road a good many times, and I do not think I have made any mistake. Indeed, I have made a far better record than that on a part of the route, but I will not tell it here for fear you will call it a fish-story.

At the age of 12 years I began riding the old-fashioned velocipede—a front driver. Later on, I rode the "good old ordinary;" and when the day of the safety came, like the rest I rode that. As a natural consequence, my muscles have had a better opportunity for development than those of most riders.

Now, I do not suppose I should be able to keep up with Bro. Merrill and his century company on his rides over his roads. Indeed, while in Wisconsin I tried to make a century inside of ten hours, just as I had done a number of times on Ohio soil; but I found that 40 miles over the hills and over sand was all I wanted to make, and I was "awfully tired" at that.

In all my wanderings on the wheel over the country, I never find any roads that I like better than the hard clay roads within 100 miles of Medina. York State roads, while in many places hard, are too hilly. Wisconsin roads are good in some places, but they are very apt to be sandy or hilly. The Illinois roads are pretty good; but in the western part of the State they are bad. The Indiana roads are good, comparing favorably with those of Ohio.

#### THE BLIZZARD IN TEXAS.

IN a private letter dated Feb. 20, Mr. F. A. Lockhart informs us that they have just passed through the worst blizzard that was ever experienced in that part of Texas—the southern part. The mercury ranged there from 2 to 16 above zero, between the 8th and 14th. Many birds perished in the storm. The unusual sight of snow six inches deep on the level was witnessed, and in places it was drifted ten feet. Mrs. Atchley carried her best breeding colonies into the house, and thus her loss will be light. It was part and parcel of a storm which will become historical.



#### THE OYSTER INDUSTRY ALONG THE COAST.

Oysters are very plentiful all along, and a description here of the way they are handled will perhaps answer for any, especially the way they are handled in small places.

A little building stands out in the river, on piles. A woman and her children seem to have charge. The boys go out in boats, and pull up the oysters with a pair of long-handled tongs, something like two steel garden-rakes riveted together, after the manner of a blacksmith's tongs. The rakes are spread open, dropped to the bottom of the river, and the handles pulled together as the oysters are lifted into the boat. The boys run the boat up to the side of the little building, and a smaller boy takes a hammer and breaks the cluster of shells apart. The mother then pries open the oyster, empties the contents into a large tin can; and a pretty little miss with her wheel (a regular two-wheeled bicycle) then takes the oysters all over town in a little tin can. Like the ice manufactured here, they are gathered and carried around to customers as fast as wanted. The day's work consists in supplying the demand. Dr. Oren tells me oysters grow only where fresh and salt water mingle. Where streams of fresh water run into the ocean, oysters are found along the shores. They are good only in the winter time. They spawn along in the spring, the spawn floating on the water and catching fast to sand, stones, etc., as the tide comes in and goes out.

Oysters are large enough to eat when about one year old. If you want great big ones, however, you must wait until they are two years old or more. I have heard people say the oysters are finer up farther north; but I certainly never found any more agreeable to my taste than what we have here in Florida. I could not help being impressed with the fact that this wonderful—this *tremendous* supply of luscious and nourishing food—is a special providence, or, as I have loved to term it, only *another* one of God's gifts. The great mounds of empty shells seem to attest that oysters have been a favorite food of mankind away back in the earlier ages.

In many places along the seashore there is a hard sandy beach sloping gently toward the water, but otherwise as flat and level as a floor, and almost as hard. It seems almost incredible that the receding waves should leave the wet sand so compact that a carriage-wheel scarcely leaves an imprint. Yet such is true. Saturday, Jan. 26, I took my first extensive wheel-ride. I made the distance from Daytona to Ormond, 6 miles, in 25 minutes. Perhaps I have mentioned that, for a month or more, I have been suffering from a cough and frequent chills, and I had begun to be almost afraid that even Florida wasn't going to drive them away; but when I got to riding my wheel at a good speed, with my mouth wide open, taking in the salt sea air, it seemed as if the chills and bronchial trouble melted away like frost before the sun. When one undertakes to leave the wet sand and get up on main land he encounters dry sand that drifts and piles up exactly like snow in the North. The sand is so exceedingly white and snowlike that one almost unconsciously pulls up his coat collar as he attempts to wade through the drifts. Of course, no wheeling can be done through this shifting sand.

As I passed the long bridge at Daytona I noticed a party of men and women fishing from the bridge. This is such a common thing that I paid no attention to it until somebody pulled out a two or three pound fish. I decided to slack up my wheel and look at the catch. Just then somebody spoke out, "Why, there's A. I. Root on his wheel, as true as I live."

I began wondering who in the world away down here in Florida should speak of me in that way. Just then the cashier of our bank in Medina, O., put out his hand, with a genial exclamation of surprise, for he was the man who had pulled out the big fish. Then another Medina man—in fact, a near neighbor of ours—came forward with his greeting, and I was surrounded by some of our own people.

I forgot to say that, on the seashore, there are many wonderful things. Beautiful shells of variety without end are brought up by almost every receding wave, and occasionally a jelly-fish as big as a tin milk-pan. Now, they call this a *fish*; but imagine a piece of the most transparent glass, the size of a common saucdish, and you have exactly one of the smaller jelly-fish. The only thing that makes it look like a plant or animal is that, on one side, there is a series of scallops as regular and perfect as ever seen in any glassware decorations. The animal can not have any organs of nutrition or digestion—at least, so it seems to me, for it is so transparent; yet the keenest eye can see nothing. Right here I am told that the above is not quite true, and a lady says they have sense enough and life enough to *sting*, and that she has been stung herself. On further questioning she says they do not sting unless you break them open. Then they exude an acrid juice. Perhaps some scientific reader can tell us more about this queer phenomenon. On further questioning, those who are acquainted with them say that, if you pick them up, they will pull all to pieces because they are made entirely of soft jelly.

Our next move brought us to the home of J. Y. Detwiler, who lives on the peninsula opposite New Smyrna. Friend Detwiler has a beautiful house, visible for a mile or more in different directions along the coast. As he has been for many years more or less of a bee-keeper, our bee-keeping friends will find his rooms to let quite convenient, both to the seashore and the pretty little town of New Smyrna. Sunday morning we found our way to the Congregational Sunday-school. I think friend Detwiler introduced me to the superintendent as something of a Sunday-school worker, and very soon I was called upon to speak to the school. At the intermission between Sunday-school and preaching service the pastor of the church, finding out who I was, insisted that I should occupy the pulpit in his place. He gave as a reason that quite a number of people were present that day from Hawks Park, the home of W. S. Hart, and that, by previous arrangement, he had agreed to let me talk to the bee-keepers and others who might be present. Here I was in a predicament. I had not thought of any thing of the kind; in fact, our Sunday-school quarterly had been left at some of our previous stopping-places so I had not even given my usual thought and preparation to the subject of the lesson. However, I hastily chose a text and spoke as well as I could. At the close of the meeting the good pastor announced that A. I. Root would speak again briefly at the Christian Endeavor meeting, Sunday evening. As the Endeavor meeting was at seven o'clock, and friend Detwiler lives more than a mile away across the water, we were obliged to go to the meeting in the evening after dark, in a sail-boat, as we had in the morning; and it is

this boat-ride after dark that I want to speak about especially.

The minute we touched the water, friend Detwiler shouted to me to see the phosphorescence. I had heard of such a thing before, but I confess I had never even faintly realized what it was to see a boat literally plowing through liquid fire, throwing up sprays and rolling tiny red-hot (apparently) globules over the water at every splash. When he took the oars it was really a splendid display of fire-works. I dipped my hand down in the water and tossed it about. We soon discovered that the display was much more vivid at some points than others. Friend Detwiler said he thought this was because some portions of the water were warmer than others. When we stepped from the boat to the shore I went to examining the phenomenon along the sandy beach, and exclaimed, "Why, look here! this phosphorescence is clear out of the water, and sparkling away up on the gravel."

He came to my side, but soon began to laugh. "Why, Mr. Root, you are so excited that you are walking right down into the *salt water*, and imagining you are on dry land."

Thus ended a very busy Sabbath day, and to myself, at least, a very happy one. Our readers will find my talk to the Sunday-school embodied, with a little alteration, in a Home Paper for this issue.

Monday morning we moved on to Hawks Park. Perhaps I should remark that I took a hasty ride on my wheel Saturday night down the beach from New Smyrna to Hawks Park, to let the bee-friends know I was in the neighborhood. While there I invited them to come up to New Smyrna to church; and this, perhaps, somewhat accounted for a part of the audience on Sunday. While the greater part of Florida can not be called the best ground for wheeling, I want to say there is nothing in the world, at least so far as I have found, any finer than the shell roads along the river in New Smyrna. I rather prefer it to the ocean beach, because it is just enough up and down, with nice little curves to vary the monotony. I had to hurry up some on account of the coming darkness on that Saturday night; and swinging around the curves and going up and down on that shell road with its wonderful tropical scenery and strange sights on every hand was one of the most inspiring and enjoyable rides I ever made anywhere. I had another one over the same route Monday morning, in going to Mr. W. S. Hart's. In passing friend Hart's orange-grove from the road, you get only a glimpse of some sort of building back through the thick growth of forest. But when you open the gate and go inside, there seems to be a pretty good building all unoccupied. A little beyond are the orange-groves. Each grove comprises, say, from one to two acres, and around each is a belt of unbroken forest to shield it from the frosts and cold winds. Each tree is a model of symmetry and vigorous growth, and nowhere in Florida have we seen oranges of such size and symmetrical shape, together with perfect color, as we found here. The secret of it is perfect cultivation of the soil, liberal use of commercial fertilizers such as are found to be best, with thorough spraying to get rid of rust and scab, or any thing that might mar the beauty of the fruit. Friend Hart has for years been prominent in the horticultural work of the State of Florida, and has, perhaps, as perfect knowledge on all matters pertaining to Florida fruit culture as any man in the State. Therefore it is no wonder that his fruit is second to none. In fact, he gets a fancy price for it, for none but fancy fruit goes out with his brand. His orange-packing house

is a model of neatness and convenience, embracing all of the most improved inventions up to the present day. He pays an extra price for better material for boxes than I have ever seen used for the purpose. In fact, when we visited the Congregational church on Sunday I was struck with the wonderful beauty of some panels selected from specimens of Florida pine. When I asked about it I was told the panels were selections from some of the finest boards used for the sides of orange-boxes. The hoops with which the boxes are bound are made by an invention of Mr. Hart's, from long slender stems of palmetto-leaves.

The process of gathering and packing is something like this: The fruit is carefully picked, using ladders and step-ladders for the highest branches. It is placed in a peculiar basket something like the German tub hung over the shoulders, as illustrated in GLEANINGS for 1894, p. 202. The pickers take every thing—good, bad, and indifferent. Then the fruit is poured out into a peculiar orange-box, made so one will pile up over another and keeps its place securely, yet with the sides so low that the pickers can not heap the oranges so the box above will mash them. Not an orange is bruised or mashed during the whole process. They are drawn to the packing-house in a wagon, and emptied into a large slatted-bottom tray or vat. This tray swings on pivots so the oranges may be made to roll either side of it. The first-class, gilt-edged fruit, is selected and thrown into a hopper. This hopper, by an ingenious arrangement, sorts the fruit, placing each size by itself, sorting them from 96 to the box down to 250. Each size is then picked up, papered, and packed. Each paper is stamped with friend Hart's brand, and a pretty show-card is put on top. Some scalloped shelf-paper is daintily placed around the edge; then the smooth veneer covers are put in place.

Now, the old-time way is for the packer to put his knee on the cover, bringing it into place, bruising and mashing some of the fruit. Not so here. A pretty piece of mechanism brings the cover gently against the fruit, forcing it down hardest right where it is to be nailed. In fact, the fruit is handled almost like eggs, and the boxes, too, are handled as if the contents were eggs, as far as possible, until they are in the hands of the consumer. Mr. Hart's trade is principally with a class of people who want the prettiest oranges to be had, even if they do have to pay a little more for them. I have taken pains to give these full details, because it is exactly what I find whenever I visit a fruit-grower or even a farmer, who gets gilt-edge prices for his products. A handsome package certainly goes a long way toward getting good prices. Orange-packing establishments, bee-keepers' apiaries, and other like places that are used at only certain periods of the year, are very likely to be found untidy, full of cobwebs, etc. Now, friend Hart may have done some clearing up because he expected me to come and may be make comments in regard to his arrangements. But even if he did, he ought to have much credit for succeeding so well. His whole packing-house and much of its complicated machinery is made of resinous Southern pine; but every piece of wood about the whole place seemed to be not only planed smooth, but sandpapered until every thing looked like glossy hard-wood finish in a nice dwelling-house. The multitude of little conveniences and inventions in the way of short cuts makes one readily believe he has studied to simplify the details, perhaps day and night, for years.

While in the orange-packing house we noticed the following courteous hint to loungers,

and it hits the point so exactly that we copy it, thinking it may be of use to others who have similar places of business:

"Callers are welcome, but I trust they will bear in mind this is no place for long stories, loafing, or gossip."

His honey-house and apiary are a good deal after the same plan. The frames of honey are wheeled up to the upper story of the honey-house, in a cart made for the purpose. After the honey is thrown out it runs by gravity into a sun evaporator, the honey flowing around partitions so as to go slowly zigzag over a large extent of surface, glass sashes being placed over it during the evaporation. Of course, it is placed where it will get the full benefit of the direct rays of the sun. From the evaporator it goes into a large storage-tank from which it can be readily drawn into barrels. Something like sixty barrels, containing twelve or fifteen tons of honey, were stored in the lower story, or honey-cellar, during our visit.

The above is just about half of the whole crop of honey.

As there has been some bungling in the attempt to give the exact amount of honey stored by a single colony placed on scales during the season of 1894, we give the following figures, taken from Mr. Hart's memorandum-book:

May 14.....	57 lbs.	June 16.....	44 lbs.
May 22.....	50 "	June 25.....	50 "
May 27.....	12 "	June 27.....	15 "
May 28.....	42 "	July 6.....	58 "
June 2.....	51½ "	July 16.....	33½ "
June 11.....	46 "	July 26.....	48½ "
June 12.....	15 "	Aug. 6.....	14 "
Total.....			554½ "

By the way, I want to say here that friend Detwiler wants all bee-keepers to test dipping-boards made of Spanish cedar. It can be purchased in our large cities; but you can test it on a small scale by using the cover of a cigar-box. His boards are always made of Spanish cedar. He says it does better work, and lasts longer, than any other kind of wood to be found in the world.

It is quite interesting to go over friend Hart's grounds and around his house, and see the great variety of fruits that may be grown with more or less success in Florida. Here for the first time we saw the wonderful scuppernong grapevine. A single vine, if given trellis enough, with a little training will cover almost a quarter of an acre; and this one vine will often yield hundreds of pounds of fruit.

Mulberries are largely raised in the South, and somebody suggests they can be grown so cheaply that they are valuable for the chickens, keeping them from having a desire to meddle with other more valuable fruits. Guavas also will yield fruit almost every month of the year; and, judging from specimens of canned ones, as large as apples, furnished us at Dr. Oren's, we regard them as a most pleasant and agreeable substitute for apples. Brother Hart says they are the poor man's apples in the South. The bushes grow with wonderful luxuriance on almost any soil, and without any care; in fact, the dryer and poorer and more sandy the soil, the better the guava seems to flourish. The fruit is even now hanging on the bushes; but both bushes and fruit too were used up by the frost. We are told the bushes are killed clear down to the ground; but no one seems to think it matters very much, for they will be up and in full bearing again in an incredibly short space of time. Cuttings for figs are sometimes planted in the spring, and yield a crop of ripe fruit before another spring.

Dr. Hawks, who gave Hawks Park its name, paid us a visit during the evening. He has written a book entitled "The East Coast of Florida," and it contains matters of much in-

terest pertaining to this coast of Florida. The book is the result of his own travels and investigations. He paid me a high compliment in something like the following words: "Mr. Root, you are not aware, perhaps, of the extent of the great industry you are largely instrumental in starting up all over the world, especially through Florida. Your enthusiasm and zeal did much toward developing bee culture, and in advance of what it would have been otherwise, and your A B C book is still doing its work of making the desert bloom and bear tons upon tons of a delicious food product." And this reminds me that friend Hart said I must call upon a young man who is just commencing in the bee-business. We found him poring over the pages of the A B C. His bees had got to robbing, and he was in trouble to know how to stop them. I told him to come along with us, and either friend Hart or myself would fix the robbing business in short meter. I felt sure we could, because the bees were gathering considerable pollen and some honey. Well, several colonies that he supposed were robbing were, in my opinion, only having a play spell. There was robbing, however, at one stand. This stand had the nameless bee-disease, or bee-paralysis, when he purchased it. Somebody had said through GLEANINGS that feeding was a good thing. Now, though the bees had an abundance of sealed stores he put in an additional story and set in a dish of honey, and this dish of honey caused the robbing. To stop it he had kept the bees shut up for three days, so they would not know where their old home was. We let them out, and in ten or fifteen minutes they organized a guard around the entrance, dragged out their dead, and took care of themselves. Friend Hart says he has never had this disease kill a colony in his own apiary. Sometimes it disappears of its own accord, and it almost always does after giving the bees a new queen. By the way, I am told by all the bee-keepers I have met that foul brood has never yet been seen in Florida. If bee-keepers could unite and stamp it out at the outset, if it ever does appear, it will be worth thousands and thousands of dollars to the State.

Our next visit was at E. A. Marsh's. To reach the place I made a trip of eight miles on the wheel, and the most of it through the soft sand. For the first time since my severe cold and hoarseness, contracted about Christmas time, I rode in my shirtsleeves, with vest unbuttoned, and bareheaded. After my trip, while wet with perspiration, I took a bath in the salt water of the Hillsboro River, and did not take a particle of cold; in fact, I knew I shouldn't. The thermometer was up to between 80 and 90°.

Friend Marsh's people have come all the way from Massachusetts, and have lived here about nine years. They put up a temporary dwelling for camping out, and they laughingly said they were "camping out" still, with no desire to go back up North. In one respect, at least, they are a remarkable family. For instance, while there an intelligent, beautiful-looking horse by some hook or crook got into the garden stuff down in the hammock. Friend Marsh stood in the door and called to it away across the lots. The horse came up at once, and part of the way at a very brisk gallop. Now, he did not come because he expected to be fed, for, as soon as the gate was opened, he went straight to the stable where he belonged. Mrs. Marsh said the pigs and chickens would do the same; and by way of a crowning exhibition of what intelligent training will do for the animal kingdom, her daughter, with a bit of cake in her fingers, called some beautifully plumaged blue-jays out of a neighboring tree. They alighted

on her hand, and ate the cake. Afterward Constance did the same thing, thus proving that it was not because it was some one they had become acquainted with. We were told they did this when a woman offered them food, but they hadn't the same faith in *man*kind.

I should right here describe friend Marsh's gardening, but a more extended description of the same thing will be found in our visit to friend Fröscher's.



For flesh and blood hath not revealed it unto thee, but my Father which is in heaven.—MATT. 16: 17.

I have mentioned elsewhere (see page 186) the Sunday-school at New Smyrna. That Sunday morning I discovered our quarterly had been mislaid or lost, and we were too far from any one who had the lesson to find out exactly where it was, before going to the church. As soon as I took my seat in the class I began looking over the lesson hastily; but before I had hardly gotten a glimpse of it the superintendent of the school asked me to give them a little talk in regard to the lesson just before closing. For a time it really seemed as if I couldn't collect my thoughts or find a single point in the whole lesson on which to base any remarks. I have never been in the habit of refusing any such request; and, in fact, quite a number of bee-keeping friends were present, and it would look a little singular for *A. I. Root* to refuse to speak just a few words to them. I commenced praying to myself that God would give me of his Holy Spirit that I might not disappoint the friends who were looking to me, perhaps, for a little portion of the "bread of life," and that I might have wise counsel and encouragement for any who might be fainting by the wayside. For a time it seemed almost as if I should be obliged to ask to be excused. Satan suggested that it was out of my line; that I was out of health; that I was too hoarse to talk, any way, etc. But I held fast to the Bible promises. I had been through similar trials before, and had faith to believe that my petition for help would not remain unanswered. I thought of the text, "If ye, then, being evil, know how to give good gifts unto your children, how much more shall your heavenly Father give the Holy Spirit to them that ask him?"

Just before the lesson closed, and almost as the superintendent began to introduce me, my mind began to center upon the text at the head of this talk, and for the first time in my life the latter part of the 17th verse had a new—a wonderfully new—meaning. All at once I began to comprehend that the plainest evidence any mortal ever had of the truths of the Christian religion was the evidence of the Holy Spirit, the words that God the Father speaks to the heart of each child of his. And this was my message to the people, most of whom I had never seen until that morning. As I stood before them I told them of the Sunday-school away off in Ohio, of the class of boys that gathered every Sunday, to be taught by me. I told them of the old mother who also was always present at that Sunday-school, and of an experience in her life she had told me of again and again. That experience was something like this:

She united with the church when only twelve or fourteen years old; but as there was a good deal of gaiety, going to parties, etc., shortly after, her religion began to seem to her a rath-

er secondary matter, and she drifted away at last, to a certain extent, as many an older Christian has often done. She was at that age undecided as to what she ought to do about going to dances. Her father rather preferred to have her go, and his influence was of a somewhat worldly character. She finally felt so uneasy and unsatisfied that she prayed very earnestly that God's Holy Spirit might guide and direct her, and tell her what she ought to do. She also prayed most earnestly for a plain and clear evidence that she was a child of God, and that the teachings of her Bible were *true*. You will please consider that she was getting considerably under the influence of those who led into skepticism rather than toward a devoted Christian life. She says that her prayer was at once and with *wonderful distinctness* answered. The bright peace and joy that came with the answer was so clear that never *once since*, in a busy life of almost 70 years, has her mind so much as *wavered*. That answer was the secret of the bright clear faith that has shown from her face and every act during all her life. I have never, since I can remember, seen my mother lose her faith. I have seen her on her knees in earnest prayer, and I have heard her voice in prayer for myself and every other member of a family of seven children. The fact that I stand here to-day with a like faith, bright and clear, I owe to that mother's faith and teachings and prayer more than to any thing else in this world.

Jesus tells us, in the words of our text, that flesh and blood did not reveal unto Peter that Christ was the Son of the living God. It wasn't the testimony of friends; it wasn't the teachings of the pastor; but it was God's Holy Spirit, the Father in heaven, who revealed this wonderful truth to Peter.

And now, dear friends, for the personal application. If there is any one whose eyes are resting on these words, and who doubts the divinity of Christ, who feels undecided in regard to the claims of Christianity, the very best evidence that can be given in the *whole wide universe* is the testimony spoken, perhaps not in words, but in some way still plainer—the testimony of the Holy Spirit. Go to God in prayer; go to Him who fashioned us after his own image—the Father who created us and brought us into the world—he who is the beginning and end of all things, and ask *him* to make it plain to you what you ought to do. He will guide you and direct you. He will tell you what no other being can tell, and he will tell you the *truth*. The evidence that every Christian may have, if he has not had it already—the evidence straight from the Holy Spirit to the heart of the inquirer—is the best evidence we can possibly have.

My experience was much like my mother's. I shall never forget the time when I knelt alone by myself and uttered my first prayer—at least, the first prayer since I had arrived at the age of manhood. It was a simple, honest petition for help and guidance. Why, dear friends, I was in so much doubt and uncertainty—in so much *distress* because I was tossed about in the wild sea of doubt—that my first words were, "O God, if there be a God, listen and hear the petitions of thy poor unworthy child." I don't remember the rest of the prayer uttered in the darkness of the night, alone by myself; but I do remember the faith and peace and joy that came upon me all at once—a faith that has never deserted me—no, not for one brief instant. I have been through trial and suffering; I have almost lost consciousness in the delirium of fever; I have been sorely tempted by the evil one at such times of temptation; I have again and again prayed for help, even as a child in

distress calls to a parent; and this same Holy Spirit has again and again spoken peace to my soul.

Another office of the Holy Spirit is to rebuke and reprove and convict. One who prays for the influences of the Holy Spirit must expect to have his shortcomings made plainer to him than they ever were before. He must expect to see sinfulness in the light that God sees it. Sometimes we persist in our stubborn ways until our neighbors and best friends are obliged to remonstrate with us. These friends feel pained at our course, and naturally dread the disagreeable task when it must be done. Very well; if you pray that *God's Holy Spirit* may guide you, it will begin, in time, to tell you of your *faults*; in other words, the twinges of conscience will come oftener and plainer when you do wrong than ever before.

I may never see you again, friends. These words may be the only ones you will ever hear from my lips; but I do not know any more valuable message I can give you than to tell you to pray often for the guidance of the Holy Spirit, especially when you are in doubt. Then is the time to ask the God who made you, of the truth of the Christian religion. If any one here is ever tempted to doubt that Christ is the Son of God, let him go to the Father and he shall surely have an answer. Of course, I am presuming that this prayer is an honest one; that the one who utters it is ready and willing to do God's will; that he is ready to give up all and every thing for the *truth* when it shall be made known to him. Do you doubt God's willingness and readiness to give personal assurance to every child of humanity? Read again the words I have once before quoted:

If ye then, being evil, know how to give good gifts unto your children, how much more shall your heavenly Father give the Holy Spirit to them that ask him?—LUKE 11: 13.



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